



# OMEGA



Oceanography, Meteorology, Environment, Geology, & Astronomy

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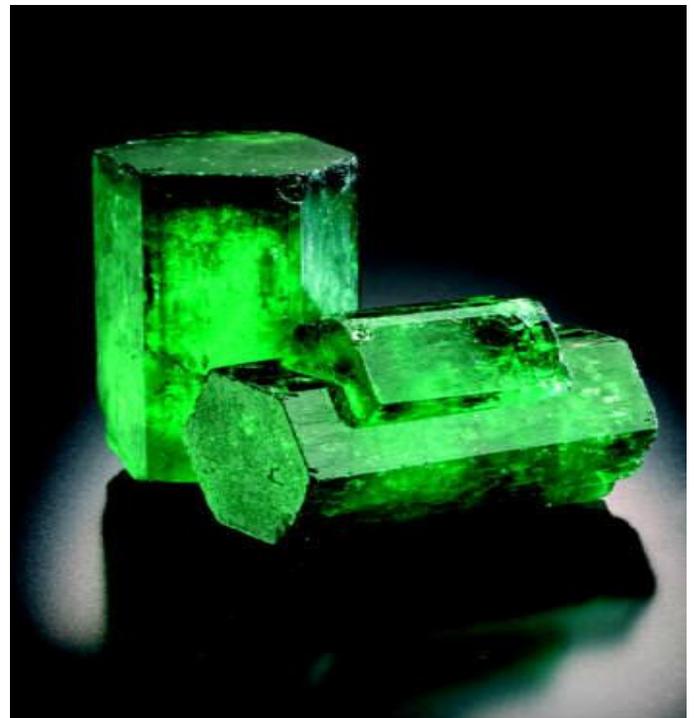
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## In this Issue...

	Page
Presidents' Message	2
Earth Science News	2
AMS Course Offerings	4
News from the NJGWS	5
News from the State Museum	6
Paleo Field School Brochure	8
National Congress on Science Education Report	10
Website Update	10
Lesson Spotlight (What Season is it?)	11



## ***PRESIDENTS' MESSAGE***

The Earth is a complex and dynamic system. Earth Science consists of the following four branches of science: Geology, Meteorology, Oceanography, and Astronomy. It is one of the most important sciences in the educational community because it does have these four sciences built into it. When you go back and look at all the problems that we have encountered as a science community in recent years including, but not limited to global warming, Hurricane Irene, Hurricane Sandy, and the increase in the number of tornadoes that we have seen across the US, it does indeed indicate a future where we as a society have our hands full. The interesting fact is that all this revolves around Earth Science.

Not only are we educators, but we are scientists as well. Like other scientists, we are developing an understanding of how the Earth is working as a system and how it's responding to different natural changes or changes caused by the human population that we have encountered over the years. It's our jobs as educators to pass this information onto our wonderful children who will be handed these problems. In addition, we must prepare them on how to tackle these problems.

As educators, we are making a world of difference each and every day. I thank each and every one of you for your hard efforts in educating our young minds and making a world of difference in the field of education and in our Earth Science Community.

Yours truly,

Steven H. Timmerman,

NJESTA President



## ***EARTH SCIENCE NEWS***

### **Common Core ELA and Math – They're here!**

Education in New Jersey from a teacher's viewpoint looks a lot different today than it has in the recent past. Changes in evaluation, assessments, and what we need to teach have gone through a genesis, and perceived as good or bad, it is our new reality. So it's time to use our talents to embrace these changes to ensure our students are prepared for the new versions of high stakes testing slated to begin in the near future.

In the case of English Language Arts and Literacy Common Core Standards, we science teachers cannot hide from the fact that there is an expectation that we will prepare our students to be science literate. Whether it's from textbooks or science literature, gone is the excuse "the kids don't read" when choosing not to require students to read in science. The ELA's clearly spell out what students need to know and be able to do in each grade band (grades 6-12) in order to become science literate. Refer to ELA Common Core website

(<http://www.corestandards.org/ELA-Literacy>) and select Science & Technical subjects to access the standards related to your grade band. After reading through what is expected of us and visit to our language arts colleagues may give provide some insights on how to implement these standards.

Our field is constantly changing as demonstrated by what we see in the news and in professional and popular journals, and bringing in these news items is a way to engage our students with the required reading and writing standards. Perhaps a building or a district PLC is the way to go to ensure consistency across building in how the standards are met in each discipline. Ultimately we all want our students to be science literate and we have the ability and passion to ensure we meet that goal. Be sure to bookmark the NJ Department of Education website to stay on top of state level changes and how they may affect what you do in the classroom (<http://www.state.nj.us/education/cccs/>).

### **NGSS – Its coming!**

The Next Generation Science Standards (NGSS) will be a reality before you know it! If you haven't taken a peek at them, now is a good time to get a handle on how they will impact you in your profession as a science educator. New Jersey is one of 26 Lead State Partners assisting with the crafting of the language of the NGSS, and will likely adopt the standards once they are completed in early 2013, although it will be a couple of years after before they must be fully implemented by districts. What can you do to prepare for what will be the new guiding document for our profession? Plenty...

First step is become familiar with what guided the writers of the NGSS. The creation of the *Framework for K-12 Science Education: Practices, Cross-cutting Concepts, and Core Ideas* began in the summer of 2010. The National Research Council organized an exemplary committee who used the latest research on how children learn science to create this document. After extensive vetting through science, engineering, and education organizations as well as thousands of people organized in focus groups, the document was completed in the summer of 2011 and published in its final form in spring of 2012. The purpose of this document was to provide the foundation upon which the NGSS were to be constructed. Everything you see in the NGSS can be traced back to the *Framework*, and therefore starting your grasp of the NGSS should start with a grasp of the *Framework*. It can found online at National Academy Press and downloaded for free. ([http://www.nap.edu/catalog.php?record\\_id=13165](http://www.nap.edu/catalog.php?record_id=13165))

Second step is to be a part of the review process. Everyone will have their final opportunity to provide feedback on the NGSS in January 2013. Watch for an announcement about the review process. Please keep in mind that the writing team reads and takes into consideration every comment. Initially the document may appear a bit daunting, and this is where the creation of small building level or discipline level committees may be beneficial to discuss the content and potential implementation of the NGSS.

Third step is to be reflective. Teachers are naturally reflective and the NGSS will require is to reflect upon what we are currently doing is in the spirit of the NGSS. Especially at the high school level we get too wedded to our content without consideration of how science actually happens within our domain. Questions to think about: are we including at least some small component of science "practices" in our daily lessons? Are we considering how students may transfer what we teach into a different science class in the future? And are we using assessment tools that truly reflect science as a way of knowing about the natural world?

We all want our students to be college, career, and civic ready and science education has the power to guide our students to think deeply and differently. The NGSS provides a road map to ensure we are all preparing our students. Visit the NGSS website for resources and a timeline: <http://www.nextgenscience.org/>



## AMERICAN METEOROLOGICAL SOCIETY

### AMS Course Offerings by Susan Twidle

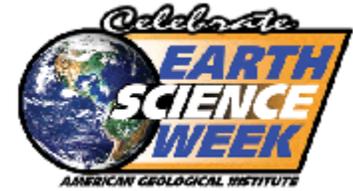
This summer, I was fortunate enough to be accepted by the American Meteorological Society for its Project Atmosphere Course. I spent 12 days in St. Louis, Missouri (during the height of the drought) with 18 other teachers from around the country. We worked through their modules on weather and climate, and had the chance to meet with and learn from experts from The National Hurricane Center, the Storm Prediction Center, the Space Weather Center, the National Center for Environmental Prediction and many other N.O.A.A. agencies. We witnessed a weather balloon launch, ate authentic KC barbecue and enjoyed tremendous collaboration and sharing! If you are interested in having this experience, please take a look at their website <http://ametsoc.org/>. Look for the education tab and you will find the advertisement for this year's course in the margin on the left. All my expenses were paid- including airfare, hotel, a food allotment and a stipend! I received great materials and lessons for my own teaching and will be running a professional development workshop for New Jersey teachers soon!

If you cannot get away this long, the American Meteorological Society offers, three, **FREE**, on line courses. Again, go to the website and click on the EDUCATION tab. On the RIGHT side are their PRE-COLLEGE programs for teachers- DataStreme Atmosphere, Ocean and Earth's Climate System. These are 12 week courses delivered via the internet. There is weekly homework and a mentor teacher who will facilitate your work and project development. College credit can be obtained from SUNY Brockport. These are great courses for someone wanting to delve deeper in weather and climate systems and marine science. The most up to date information from the top experts in their fields is provided to you along with great text and lab activities. Won't you consider this as your professional development for the spring semester? Please contact me at [stwidle@frhsd.com](mailto:stwidle@frhsd.com) if you have any questions.





## *News from the New Jersey Geological and Water Survey*



Looking to get outside this fall during Earth Science Week (October 14-20), and beyond? The New Jersey Geological and Water Survey (NJGWS) would like to suggest a variety of activities available for teachers looking to make earth science interesting. Of course, what better way is there to teach earth science than to be outdoors? Here are several ideas for teaching exciting, interactive and outdoor earth science:

1. **Earth Caching**— If you haven't heard of EarthCaching, you're certainly missing out. In EarthCaching, hiking meets high-tech treasure hunt, or, in this case, in the search for amazing natural treasures. Check out the Survey's geologic caching sites at <http://www.nj.gov/dep/njgs/links.htm#earthcache>. Additional information and a free downloadable teacher's guide is available at [www.geocaching.org](http://www.geocaching.org)
2. **National Fossil Day**— This year, national fossil day is on October 17<sup>th</sup>, 2012. Check out their website, <http://nature.nps.gov/geology/nationalfossilday/index.cfm> for this year's contests and activities, including the Junior Paleontologist Program.
3. **Earth Science Week Packets from AGI**— If you haven't already, check out [www.earthsciweek.org](http://www.earthsciweek.org). The Survey mailed New Jersey teachers a packet of activities based on the 2012 theme of "Careers in the Earth Sciences". Even if you didn't get a packet, the AGI newsletter offers year-round inspiration for earth science teachers. There's even a whole section of their website dedicated to teachers.
4. **Hidden Gems of New Jersey's Park System**— This series of on-going articles is "introducing these parks to the rest of New Jersey by spotlighting recreational activities, people and natural resources that make them special." Take a look at <http://www.nj.gov/dep/daw/batsto/> to see if there's a park in your area. Many of these parks have activities, programs, and teaching resources available right from their webpages.





STATE OF NEW JERSEY  
DEPARTMENT OF STATE



## NEW JERSEY STATE MUSEUM NATURAL HISTORY

### *News from the New Jersey State Museum*

Jason Schein, Assistant Curator of Natural History

[Jason.Schein@sos.state.nj.us](mailto:Jason.Schein@sos.state.nj.us)

As always, the Bureau of Natural History at the New Jersey State Museum was extremely busy this past summer. In addition to research, our projects at the Museum, and fossil excavations at our primary field site in Gloucester County, we spent two weeks in southern Montana and northern Wyoming collecting Late Cretaceous and early Paleocene fossil plants, turtles, crocodiles, stingrays, mammals, and dinosaurs. Each year we lead an expedition to the fossil-rich rocks of the Lance and Fort Union formations in the Bighorn Basin on the eastern flank of the Rocky Mountains.

This is a serious scientific expedition, one that has been on-going for decades. However, one of the most important and rewarding parts of the whole experience is educating people from all walks of life. The trip isn't just about paleontology: we take every opportunity to talk about the geology of the region, as well as the plants and animals that inhabit the area today. As scientists, we are acutely aware of the need for increased science literacy among the populace, especially in the earth and natural sciences.

This past season we hosted college students from across the country, Earth Science teachers from NJ and PA, a group of young ladies in high school from inner-city Philadelphia, and several other "old" friends. Our college students receive credit as part of a course that we teach, and the teachers receive professional development credits for participating. Everyone, regardless of background or skill-level, had a wonderful time, and we're looking forward to having them return next year.

The scenery is stunning, the landscapes harsh and unforgiving, and the fossil hunting spectacular. Everyone there, including the lucky ones that get to do it every year, all agree that this is an amazing experience. We're always eager to share our knowledge and love for the land and its inhabitants – past and present – with others that share our interests. If you are interested in joining us, please contact Jason P. Schein, at the New Jersey State Museum.

See photo on next page...





The 2010 Paleontology Field School team excavating a hadrosaur in northern Wyoming.



# Teachers!

Join us on a  
*Dinosaur  
Hunting  
Adventure!*



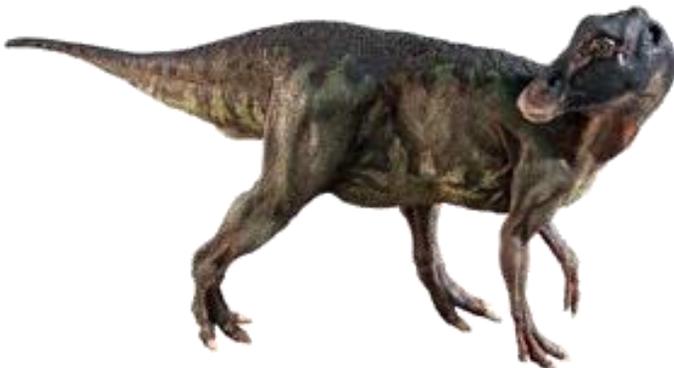
Members of the 2012 Paleontology Field School team in northern Wyoming.



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[www.statemuseum.nj.gov](http://www.statemuseum.nj.gov)

- ✓ Join the NJ State Museum's paleontologists on a real dinosaur hunting expedition!
- ✓ Fulfill your teacher professional development credits.



# PALEONTOLOGY FIELD SCHOOL

Learn field paleontology by experiencing it! Join the New Jersey State Museum's paleontologists in the foothills of the Rocky Mountains in Montana and Wyoming. We'll collect Cretaceous aquatic and terrestrial animals (including dinosaurs!), Devonian fishes, and rare Paleogene mammals in the Bighorn Basin.

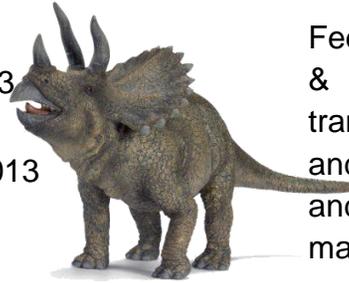
**Teachers!** Complete your yearly continuing education credits by attending the NJSM's Paleontology Field School. The NJSM is a registered Professional Development Provider for the NJ Dept. of Education Professional Standards Board (#2241). This trip fulfills the requirements for continued certification on a credit/hour basis.

The expedition is a serious museum project and is more than just a field trip. Your efforts will aid the NJSM's decades-long paleontology research efforts in the region.

The field course is led by David Parris, Curator of Natural History, and Jason Schein, Assistant Curator of Natural History, at the NJ State Museum.

## DATES:

- July 14 – July 20, 2013
- July 21 – 27, 2013
- July 28 – August 3, 2013



## REQUIREMENTS:

- Must be at least 14 yrs old (under 18 must be accompanied by an adult)
- Good physical condition
- Proof of health insurance

## ACCOMMODATIONS:

Room & board are provided by the YBRA field station in Red Lodge, Montana. YBRA is a comfortable facility with typical collegiate field camp cabins. Lodging is dormitory-style, with a men's and women's cabin.



## FEES:

- \$1,150 Friends Members (/week)
- \$1,250 Non-members (/week)
- \$1,350 Undergraduate Students
- \$1,450 Graduate Students
  - Note: Students attending for credit are required to attend for 2 weeks.

10% deposit due upon registration

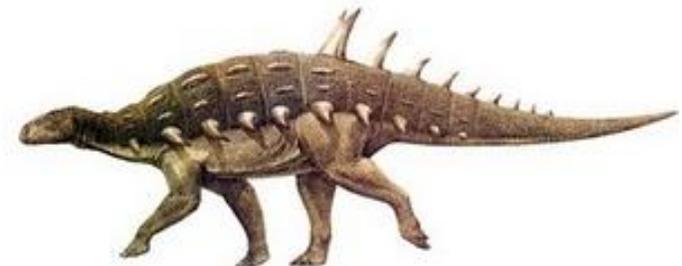
50% due May 15, 2013

Balance due June 15, 2013

Fees include registration, tuition, lodging & meals, collecting tools & equipment, transportation to/from the Billings airport and base camp and to/from all field sites, and all instruction and educational materials.

NOTE: Fees *do not* include transportation to/from your home to Billings, MT.

*Spots are limited -  
reserve yours today!*



For more information or to request an application package, please contact:

**David Parris**

David.Parris@sos.state.nj.us

or

**Jason P. Schein**

Jason.Schein@sos.state.nj.us

(609) 292-7660

Follow our adventures on our blog:  
njstatemuseum.blogspot.com



The 13th National Congress on Science Education (NCSE) was held in Albuquerque, NM - July 11-14, 2012. The National Congress on Science Education meets annually to discuss issues and make recommendations that may be of interest to NSTA and the science education community.

The overall theme for this year's meeting, "Build the Scaffolding for 21st Century Science Literacy," is based on NSTA President Karen Ostlund's goals and objectives for her presidential year. Stephen Pruitt, Vice President, Content, Research, and Development at Achieve presented on Learning about the Next Generation Science Standards. While the Framework is a finished document, he reminded attendees that the NGSS are still in draft form and subject to revisions. Watch for the next draft of NGSS which is expected to be released this November.

Congress attendees also participated in focused Forum sessions based on the "State of the Standards" and "Working with Standards." From these four issue forums, resolutions were created by the members of the Congress for the NSTA Council and Board of Directors to consider and to help direct the course of science education in the country.



## *NJESTA Website Update*



Check out our newly designed website at [www.njesta.org](http://www.njesta.org)! There are places for you to submit lesson plans, photos, links, events, exhibits and announcements.



Name \_\_\_\_\_

Date \_\_\_\_\_ Per \_\_\_\_\_

### What season is it?

You will use a globe and a light source to simulate the four seasons as the earth completes one full revolution around the sun. The light source should remain at a fixed point and the Earth (globe) revolves around it. Make sure that all members of your group are observing the model from the same perspective or vantage point. Make careful observations and write what you see not what you think you should see!

I. Position the globe so that it is to the left of the light source AND North America is facing toward the light AND the Earth's axis is pointing toward the window. Turn the light on and answer the following questions.



1. Which hemisphere (north or south) is tilted toward the sun?
2. Which hemisphere is receiving the most direct sunlight?
3. What season is it in this hemisphere?
4. Which hemisphere is tilted away from the sun?
5. Which hemisphere is receiving indirect sunlight?
6. What season is it in this hemisphere?
7. Find Position I on the diagram on page 2. Fill in all of the requested information **before** proceeding to Position II.

II. Position the globe so that it is one-quarter of the way through one revolution.

8. Which, if any, hemisphere is tilted toward the sun?
9. Which hemisphere is receiving the most direct sunlight?
10. What season is it in the northern hemisphere?
11. What season is it in the southern hemisphere?

12. Find Position II on the diagram on page 2. Fill in all of the requested information **before** proceeding to Position III.

III. Position the globe so that it is halfway through one revolution.

13. Which hemisphere (north or south) is tilted toward the sun?

14. Which hemisphere is receiving the most direct sunlight?

15. What season is it in this hemisphere?

16. Which hemisphere is away from the sun?

17. Which hemisphere is receiving the indirect sunlight?

18. What season is it in the northern hemisphere?

19. What season is it in the southern hemisphere?

20. Find Position III on the diagram on page 2. Fill in all of the requested information **before** proceeding to Position IV.

IV. Position the globe so that it is three-quarters of the way through one revolution.

21. Which hemisphere is tilted toward the sun?

22. Which hemisphere is receiving the most direct sunlight?

23. What season is it in the Northern hemisphere?

25. What season is it in the Southern hemisphere?

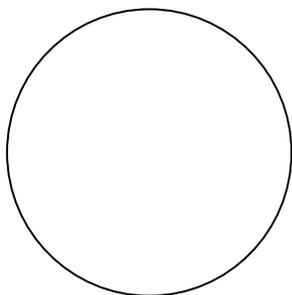
24. Find Position IV on the diagram on page 2 and fill in the requested information.

V. Consider this! Scientists have just discovered Earth's sister planet, Sororius. Sororius has the same rate of rotation and revolution as Earth but it has a tilt of  $45^\circ$ . Using your knowledge of seasons on Earth, describe how the four seasons would be different on Sororius.

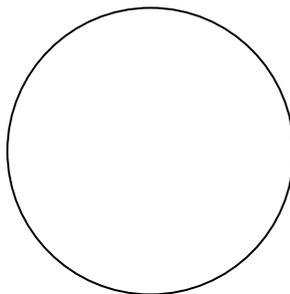
\* North Star

For each position in the Earth's orbit add the earth's axis at the proper tilt

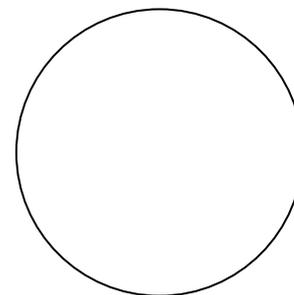
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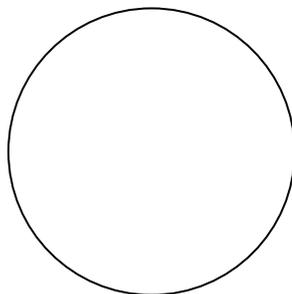
IV



III



II





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