



Seasonal Scientia

McKendree University Science Newsletter
Issue 2: Fall 2009

Featured in This Issue:

Student Research: Work at the Environmental Protection Agency

Faculty Research: Large Scale Demographic Prairie Research Underway

Course Spotlight: Comparative Vertebrate Anatomy BIO 420

When we try to pick out
anything by itself, we find it
is tied to everything else in
the universe.

-John Muir (1838-1914)
U. S. naturalist, explorer

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Seasonal Scientia is a seasonal newsletter for McKendree University Science Students, Faculty, Staff and anyone who is interested in the scientific undertakings at McKendree University. The purpose of this newsletter is to not only provide information regarding current research, events, and courses on campus, but also to tie together the scientific community at McKendree. Beyond the science on campus, we additionally incorporate worldwide headline news and calendar events both in and around the greater St. Louis area to encourage broader scientific engagement. While the content is always new, each 'Scientia' issue is comprised of 5 main sections:

- **Recent Happenings** – science events and news at McKendree
- **Sigma Zeta** – Science and Math Honor Society news
- **Research** – highlighted student and faculty research projects
- **Course Spotlight** – in-depth review of one of the science courses
- **Senior Thesis Research** – highlighted student project

Seasonal Scientia is written primarily by science faculty at McKendree, but we encourage student and staff contributions; if you have something you think would be interesting to feature in an upcoming issue, please contact Dr. Schutzenhofer.

World Science Hot Topics - CHEMISTRY



- **Chemists Create New Color by Accident** - The American Chemical Society reports that a chemist at Oregon State University has discovered a new blue pigment. Current blue pigments are rare and include poisonous (cobalt blue) and expensive (gemstones) materials. The new pigment was the result of a crystal structure formed by manganese ions exposed to intense heat. Other ingredients were also present; see the article for more information:

<http://pubs.acs.org/doi/abs/10.1021/ja9080666>

- **New Discoveries with Graphene** – Graphene, which was discovered quite recently, is a super small material – only a one atom thick crystal. Because it is also highly conductive, it has been at the forefront of much research and was most recently used to create the world's smallest transistor and thinnest balloon.

Recent Happenings

Online Teaching in the Sciences

Universities around the world are offering more online courses each year and the Math and Science Division at McKendree University is no different. In the sciences, Professor Colby (formally Fawcett) taught SCE 205 – Earth and Astronomical online for both the Summer and Fall semesters. It appears that online courses over the summer are really the wave of the future especially for McKendree. Students are not required to be on campus which allows them to instead enjoy the summer, work or participate in internships while continuing their education with formal course work. The same holds for the professors. An online course allows for teacher or student to be literally anywhere in the world and still teach and participate in the course on a regular basis. The summer Earth and Astronomical Science course was taught by Prof Colby from Pensacola, FL while most of the students were in IL or the surrounding areas. Professor Colby started the Fall 2009 SCE 205 course while in Kona, Hawaii (at the tail end of her honeymoon) then from Boulder, Colorado and finally from San Diego, California! In addition, throughout the semester several students were traveling for sports or other matters, but because the mobility of an online course, they never really “missed a day of class.” Even while moving across the country or traveling, both students and professor were able to communicate efficiently and effectively through E-mail, Skype and Blackboard. McKendree will continue offering online science courses starting with the summer offering of SCE 205 again. Keep on eye out for more science online courses in the future!

Gardens Featured in the Suburban Journals

Janice Denham, of the Suburban Journals, paid a visit to the McKendree gardens this semester. Her article, *New garden invites butterflies to McKendree*, was featured in the September 29th edition of the Journals. The article featured a discussion of how native plants serve to attract a wide range of butterflies, providing food sources across life stages, for both caterpillars (see Monarch feeding on milkweed above) and mature adults. Both Dr. Jennings, who recently installed the butterfly garden behind the Communications building at 521 Stanton, and Dr. Schutzenhofer were interviewed regarding the gardens and the butterflies that could be seen fluttering about. The article also highlighted how the gardens have been utilized by several science courses. For example, the Field Botany class (BIO 325), seen below, was able to directly compare the role of pollination in the success of native and non-native species in garden plantings. Following the article’s



appearance in the Journals, visitors of a different kind started frequenting the plants. Several community residents were observed by the Communications staff to take interest in the gardens in the weeks after the article was published. Personally, we hope they both (butterflies and people) keep coming...

What's New

Clickers!

What are clickers, you may ask? Well, they are remote control device that allows students to interact with classroom presentations. Instructors can prepare multiple choice questions and students can then submit their responses using the clicker. The technology is advantageous for the instructor because it provides instantaneous feedback on student responses, highlighting



topics in need of clarification or further review. For students, it provides a fun and secure way to test themselves and let the instructor know how they're doing. Dr. Schutzenhofer has started using clickers in her classes, and if you noticed, she was quite giddy over them!

Garden Updates

Both the butterfly and rain garden are doing wonderfully! Plants are establishing quite well behind Stanton and the rain garden is beginning to show its true colors. Students collected seeds from the rain garden

recently and will be planting them soon so they will be nice and



beautiful for the spring plant sale! (see *Sigma Zeta*)

Sigma Zeta - EZ

Sigma Zeta is a National Math and Science Honor Society. McKendree's Chapter is the Beta chapter and the oldest (1926) remaining national chapter. Currently, the chapter has 26 active members, with 14 new members having been inducted this fall.

- **2009 Induction Ceremony**

- Approximately 11 new EZ members and their families celebrated their induction into Sigma Zeta on Friday, November 13th
- The event began with a guest speaker, Chris Cahnovsky, Regional Manager, Collinsville, from the Illinois EPA
- Mr. Cahnovsky gave a presentation on the role of the EPA in the maintenance of Illinois habitats
 - His presentation was very informative and pertinent to members who are considering various career options
- The ceremony was then led by the officers
- A brief reception, including cake and punch!, was held following the ceremony in the Circuit Riders room of Bothwell Chapel

- **Other Events:**

- Reconstruction of the EZ bulletin board in Voigt
- Greening McKendree Day

- **Upcoming Events:**

- National Convention
 - The 2010 Convention will be held March 25-27th at Campbellsville University, Campbellsville, Kentucky
 - Students: don't forget to submit your abstracts to present a poster or paper!!!
- Spring Trivia Night!
 - Get your thinking caps on, get some friends, have some fun!
- Plant Sale
 - EZ will hold an Earth Week plant sale featuring native plants grown from seeds collected out of McKendree's rain garden. Be sure to get some to plant your own rain garden!!!

- **Website**

- The National Sigma Zeta website continues to receive updates.
 - The latest: pictures from last year's convention. Check them out at: <http://www.sigmazeta.org/index.html>



Founder's Cup
(currently bestowed on
McKendree's Beta
Chapter!!!!)

EZ Executive Board Officers

President:
Carrie Schumacher

Vice-President:
Jordan Finch

Secretary:
Deb Geary

Treasurer:
Amber Ramos



The most exciting
phrase to hear in
science, the one that
heralds the most
discoveries, is not
"Eureka!" (I found it!)
but "That's funny..."
~Isaac Asimov

Student Research

Student works as an intern at the Environmental Protection Agency

Deb Geary, a senior biology student, worked at the Collinsville EPA office this past summer. Deb was selected to work as an intern after undergoing a competitive application process. Deb had some fun, got great work experience, and impressed the EPA staff. I was personally told that if Deb was any indication of what McKendree students are like, that we should send more their way...



Hear what Deb had to say about her experience: "I was given the opportunity to participate and observe in many aspects of environmental regulation. Some of the facilities I visited consisted of hazardous waste incinerators, municipal sewage treatment facilities, hazardous waste producers, the Dynege power plant in Ballwin, Granite City Steel, and others. During these visits, we conducted inspections for environmental compliance and air quality control, and I was also given extensive tours of these facilities. I participated in several inspections and meetings concerning large amounts of under ground gasoline in Hartford, IL. During the end of the internship I was given the opportunity to learn how to operate a geo probe, which is used at the EPA to monitor contamination in the ground and water from facilities such as gas stations. This internship was an excellent experience for me, allowing me to gain insight into the environmental industry as well as opportunity to network."

Faculty Research

Dr. Schutzenhofer initiates demographic data collection in prairie



This past June Dr. Schutzenhofer began tagging and collecting demographic data on two species of *Lespedeza*, one native (*L. capitata*) and one exotic (*L. cuneata*). These plants can be found in a 4 acre prairie she planted last spring with collaborators at Washington University's Tyson Research Center, Eureka, MO.

Dr. Schutzenhofer is beginning a long-term investigation of how invasive species' success is influenced by a variety of factors, including nutrient availability, community assembly, and invasion history. Her goal is to understand more about invasions and to aid in prairie restoration. Dr. Schutzenhofer was assisted by McKendree student, Annie Weder (pictured below) and several local high school students. The high school students were NSF fellows participating in a summer program in Environmental Studies.



Research Opportunities

Consider Independent Study

An Independent study course involves guided, one-on-one learning with a professor in a specific area or on a specific topic. For example, this fall Lauren Sarver worked with Dr. Schutzenhofer on a research project to investigate how small mammals utilize slopes and natural bridges to traverse habitats experiencing erosion. Lauren is interested in a career in animal conservation.



The joy of discovery is certainly the liveliest that the mind of man can ever feel.

~Claude Bernard (1813-78)
French physiologist

Course Spotlight

Comparative Vertebrate Anatomy (BIO 420)

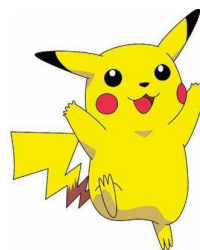
Comparative vertebrate anatomy focuses on the structural and functional differences among organisms with backbones – from fishes to mammals. After introducing broad groups of organisms we spent the semester examining how vertebrates are put together and how their anatomy relates to how they function. In addition to looking at how features like limbs and powered flight originated, we also talked about what you can learn by “looking a gift horse in the mouth” and why some Westerns have a big conflict between the cattle and sheep ranchers.

One of the main class activities is to dissect a whole range of organisms including parasitic lampreys, sharks, mudpuppies (salamanders – not dogs), and cats. While every dissection has its own quirks, the main highlight of the dissections this semester was finding the remains of the shark’s last meal and being able to identify what they had eaten.



The last day of lecture students presented their independent “design-a-vertebrate” projects. For these projects students choose a fictitious vertebrate and design a poster showing how the organism would be put together according to principles learned during the semester. In past courses, most students chose vertebrates from films (Buckbeak – the hippogriff from Harry Potter III, or the killer bunny from Monty Python). This year students went even further. Organisms ranged from classic monsters from Greek mythology (Cerberus, Hydra), through movie

“monsters” (flying monkeys from the Wizard of Oz, Gremlins) and even included a cartoon icon (Pikachu).



Looking for an interesting elective? Be sure to watch for this class in the future. It will be offered again in Fall 2011.

Quotes

“Wear clothes that you can get vertebrate on.”
- Dr. Jennings



Happy is he who gets to know the reasons for things.

~Virgil (70-19 BCE)
Roman poet.



Senior Thesis Projects

All semester, and the summer before, seven senior thesis students have been diligently working to collect data – and lots of it! Congratulations to all of you! These students include: Jean Burns, Brandon Duncan, Lauren Eveland, Deb Geary, Maegan Hamilton, Kristina Paisley, and Beth Trame.



Calendar

DECEMBER

1-4th – SMART week
2nd – FREE Science Seminar at the Zoo 7:30pm – Stem Cells
4th – Classes END
7-10th – Final Exams – Good Luck!
21st – Winter Solstice
27th – Raja, a popular Asian elephant at the Zoo, turns 17!
4-30th – Wild Lights at the Zoo

Register for Spring Classes!

JANUARY

2nd – Breeding season of gray squirrel begins
3rd & 4th - Quadrantids Meteor Shower
11th – Classes Begin!!
11th - Listen for Spring Peepers on warmer evenings
18th – No Classes –Martin Luther King Day
25th – Turkey Vultures arrive from Southern Illinois
29th – Best time to photograph and view Mars

FEBRUARY

2nd – Groundhog Day
9th – Earliest Illinois date for flowering of Harbinger of Spring
10th – FREE Science Seminar at the Zoo 7:30pm – Great Discoveries
13th – Dandelions start to bloom
14th – Valentines Day
18th – Cardinals begin singing
20th – Robins migrate
26th – White tailed deer drop antlers
29th – Elms and maples blooming

Upcoming Classes – Spring 2010

Biological Science

- Evolution (BIO 220) – Dr. Jennings
- Intro to Environmental Science (BIO 250) – Dr. Schutzenhofer
- Human Anatomy & Physiology (BIO 307) – Dr. Jennings
- Cellular Biology (BIO 313) – Dr. Van Putte
- Developmental Biology (BIO 340) – Dr. Jennings
- Animal Behavior (350) – Dr. Schutzenhofer
- Readings in Biology (451) – Dr. Van Putte

Chemistry

- Chemistry in the Modern World (CHE 100) – Dr. Ozturk
- Principles/Organic Chemistry (CHE 150) – Dr. Reese
- Organic Chemistry (CHE 250) – Dr. Reese

Physical Science

- General Physics II (PHY 212) – TBA
- Astronomy (PHY 101) – TBA