



# Seasonal Scientia

McKendree University Science Newsletter  
Spring 2009

If it's green or wriggles, it's  
biology.  
If it stinks, it's  
chemistry.  
If it doesn't work, it's  
physics.

~Handy Guide to Science

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## Featured in This Issue:

**Student Research:** Student awarded at Academic Scholarship Week

**Faculty Research:** Dr. Schutzenhofer's Endangered Species Research

**Course Spotlight:** Invertebrate Biology BIO330 River Watch

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 will additionally be incorporating worldwide headline news and calendar events both in and around the greater St. Louis area to encourage broader scientific engagement. While the content will always be new, each 'Scientia' issue will be comprised of 5 main sections:

- **Recent Scientific events** – science events 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.

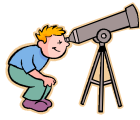
This inaugural issue was compiled through the efforts of Ms. Stevi Fawcett and Dr. Mickey Schutzenhofer as part of a greater endeavor to spread excitement about the wonderful world of science...

## World Science Hot Topics - ASTRONOMY



- **Saturn's Moon Titan is showing evidence of a "water-cycle"** - NASA's Cassini orbiter found that rain clouds are filling methane lakes on the surface of the moon. This evidence backs the idea that some of Titan's methane seas rise and fall seasonally with changes in rainfall. Titan is fascinating to astronomers because of its Earth like characteristics such as a Nitrogen abundant atmosphere.
- **Extrasolar planet just twice the diameter of Earth** – February, astronomers used the COROT satellite to discover the smallest planet yet (COROT -7b) using the transit method. The planet has a mass of approximately 5 to 11 Earth masses.

## Recent Events



### McKendree Star Party

Professor Fawcett and her Introductory Astronomy students hosted an evening of stargazing for McKendree University and the City of Lebanon just north of College Hill Cemetery on Friday night, April 24<sup>th</sup>. An estimated thirty people were in attendance that night, including students and local families. At dusk, guests made their own star charts for use later in the evening. As the sky darkened Ms. Fawcett and her students handed out red-lensed flashlights for the guests so as not to ruin their night vision and aid in reading the star charts. Four telescopes were set up, two eight-inch Cassegrains, a small 3.5-in Cassegrain and a hand held telescopes which guests could hold in their lap to scan the night sky.

Astronomy students pointed the telescopes at a variety of objects ranging from stars, planets, nebulae and galaxies. The students also guided guests in finding constellations in the sky and pointed out slow moving man-made satellites which periodically traverse the early evening skies. The highlights were Saturn and its rings (above picture left), the Orion Nebula (above picture right) and a galaxy called M82. This event was also attempted Fall semester, but partially clouded skies and the frigid night air deterred many guests. Those few, who did attend, enjoyed observing the Moon and its craters.



[www.windows.ucar.edu/saturn/images/](http://www.windows.ucar.edu/saturn/images/)



### McKendree University-Tyson Research Center Fellowship:

- Annie Weder, McKendree Biology Undergraduate, will work with Dr. Schutzenhofer during the month of June at the Tyson Research Center, an ecological field station located approximately 20 miles outside of St. Louis, MO
- She will develop independent research within the field of invasion biology, mentor two high school students through an NSF program, and have the opportunity to interact with peers, graduate students, post-docs, and other faculty researchers from the area. Additionally, there are weekly seminars, discussion groups, and opportunities to assist other researchers in a variety of projects.
- Featured in the Suburban Journals on May 6, 2009

### Congratulations to Dr. Van Putte

This coming fall semester Dr. Robb Van Putte, Associate Professor of Biology, will be going on sabbatical! Dr. Van Putte's sabbatical research will focus on the use of algae as a renewable resource used in the production of biofuel. During his sabbatical Dr. Van Putte will travel to Washington University in St. Louis as well as Texas A&M University in College Station, TX. While at Texas A&M, he will be working with Dr. Timothy Devarenne whose lab is currently exploring using biotechnology to increase the efficiency of biofuel production in various species of algae.

## What's New

### Online Courses

McKendree University is "going Online". Professor Fawcett will be teaching SCE 205 - Earth and Astronomical Sciences this summer and Fall 2009 online. Online courses provide the same amount of material as regular courses, but give students the freedom to do their course work on their own time and in the comfort of their home. Online courses are a wonderful solution for busy working students and students abroad.



### Backyard Bird and Butterfly Garden

A butterfly garden has recently been established in the backyard of the Office of Communications (Stanton 521). The garden consists of two beds (one with native flowers, the other with non-native flowers) that are attractive to butterflies. Once completed, the garden will be used in a variety of biology classes, and will also be a place where members of the community can come to learn about butterflies to develop an interest and appreciation of the natural world. For more information about the garden, please contact Dr. David Jennings.

### Biology Annual Cookout

The rain held off as students and department alum gathered Saturday, May 2<sup>nd</sup> at Horner Park alongside faculty and their families for barbeque and a game of ultimate Frisbee. This was the 3<sup>rd</sup> annual gathering and the first time that alumni were invited.

## 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 41 members, with 25 new members having been induced this past fall

- **First Science Education Day**
  - Ten EZ members and Dr. Schutzenhofer participated in this event, March 21<sup>st</sup>, in Voigt Science
  - Three classrooms highlighted three disciplines: biology, chemistry, and physics
  - Attended by over 15 local girl scouts
  - Highlights include
    - Creating bottled ecosystems, making goop, and reflecting light
  - Concluded with snacks and a glowing pickle demonstration
  - EZ plans to make this an annual or biannual event!
- **Other Events:**
  - Trivia night
  - Earth Week Plant sale
- **National Convention:**
  - Eight students, along with Dr. Jennings and Dr. Schutzenhofer, attended the National convention at Pikeville College, in Pikeville, KY:
  - **Beta chapter wins Founder's Cup**
    - Given to one chapter in recognition of active student participation at national meetings, chapter achievements on campus, and community service.
    - This marks the 4<sup>th</sup> time that McKendree has received this award (1988, 2001, 2006, 2009)- Congrats!
  - **An impressive FIVE students gave presentations**
    - Posters: Kyle Kruse, Hugo Nieto, Kamara Owens, Ramona Puskar
    - Talk: Aimee Jackson
  - Dr. Jennings was elected as President-elect of the national group and will serve for 3 years



### EZ Executive Board Officers

**President:**  
Carrie Schumacher

**Vice-President:**  
Jordan Finch

**Secretary:**  
Deb Geary

**Treasurer:**  
Amber Ramos



“Equipped with his five senses, man explores the universe around him and calls the adventure Science.”

~Edwin Powell Hubble,  
*The Nature of Science*,  
1954

## Student Research

### Student awarded during academic scholarship week!

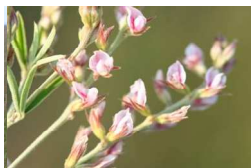
Congratulations to Kyle Kruse who was awarded under the 'research' category for his poster presentation entitled 'Computational Modeling of Borate and Borosulfide Structural Glass Units', mentored by Dr. Ozturk. Kyle's paper will be featured in McKendree's Scholars Publication.

Kyle used computational modeling to observe the continuous random network of structural units that compose glass at the molecular level. The computational modeling was used to calculate stable geometries of common glass structural units and then observe the vibrational modes of these geometries to predict the energy associated with the vibrations. The theoretical vibrational frequencies collected were compared to experimentally collected Infrared spectroscopy data of these same structural units. From these comparisons of experimental vs. theoretical, corrections and correlations were postulated to better understand why glass of different components or dopants take the random structures that they do at the molecular level.

## Faculty Research

### Dr. Schutzenhofer in 3<sup>rd</sup> year of monitoring endangered plant

Have you heard of the *Lespedeza*? If you have ever been in one of Dr. Schutzenhofer's classes, or even just spoken with her, you have! She is currently monitoring the federally threatened *Lespedeza leptostachya*, an endemic prairie plant which exists in only four states, including Illinois where it is listed as an endangered species. *Lespedeza leptostachya* is hypothesized to be in decline due to the removal of the once ubiquitous bison, which selectively eat grasses. With the removal of bison, dominant grasses experienced an increase in success, possibly suffocating out *L. leptostachya*. Dr. Schutzenhofer is collaborating with researchers at the Illinois Department of Natural Resources, the Chicago Botanic Gardens, and Washington University to investigate the role of grass competition in the decline of *L. leptostachya*. She is using a congeneric comparison with *L. capitata* (highly related, yet differs greatly in terms of success), to determine if *L. leptostachya* has increased success when grass competition is reduced. She is currently contributing data from her research to the U.S. Fish and Wildlife Service for a five year review of the species' listing according to the Endangered Species Act. The results of her work will provide essential information to the management of this endangered plant – stay tuned!



## 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, two McKendree students who took Introductory Astronomy last Fall wanted to learn more specifics on Relativity, Black Holes, Galaxies and Cosmology. They worked with Professor Fawcett this semester in an Independent study titled Extragalactic Astronomy.

### Be a Research Assistant

Dr. Schutzenhofer is looking for 1-2 students in late May and August for a two day trip to Nachusa grasslands, a prairie in Northern Illinois (see research highlighted in 'faculty research'). If you are looking for research experience, contact Dr. Schutzenhofer. Students will facilitate in the gathering of demographic data, use GPS, and get a dinner cooked by their professor!



"Research is what I'm doing when I don't know what I'm doing."

~Wernher Von Braun

# Course Spotlight

## Invertebrate Biology (BIO330)

The Invertebrate Biology course was an atypical experience this semester. As in traditional biology courses, students have a lab experience, discuss course content, and get some organismal elective credit. But this year, students in BIO330 were also part of the inaugural McKendree River Watch team! The Illinois River Watch (program of The National Great Rivers Research and Education Center (NGRREC) in Godfrey, IL) facilitates the gathering of data on 88% of the 71,394 miles of streams in Illinois where the EPA does not have enough time or man power to collect information. Data collected helps to



identify high quality streams, as well as polluted areas in need of attention. Last Friday, May 1<sup>st</sup>, students braved a local stream to sample for water velocity, temperature, and macroinvertebrates, picking up litter on the way out. They found a variety of aquatic invertebrates, including midges, caddisflies, mayflies, and copepods, as well as a leech and catfish while exploring! These macroinvertebrates are not only essential detritivores and components of the ecological system, but also serve as important water quality indicators. Way to go Invert students!



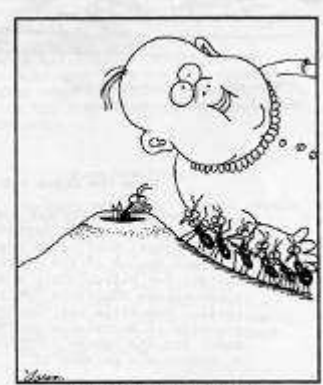
The class also visited the Insectarium at the zoo to see invertebrates and to make connections regarding their evolution and adaptations. They finished their day by stepping into the role of curator of the Insectarium and proposing new exhibits that would add to the educational and entertainment value of the displays.



### Invert Quotes

*"It really threw me off, it had eyes!"*

*- Miranda Gibson*



*"You idiots! ... We'll never get that thing down the hole!"*

*"A lovely young starfish quite famous  
Had a crush on a sea cucumber named Amos*

*She thought he was hot 'til she uttered in shock,*

*"My God! This guy breathes through his anus!"*

*-Chip Biernbaum,  
(College of Charleston)*



*Don't worry, it's not broken: I'm an invertebrate...*

## Senior Thesis Projects

A total of 9 students gave a presentation of their senior thesis projects, which culminated a three-semester research experience, including 2 students\* who presented during the Honors Celebrations.

### Larry Buck (Dr. Jennings)

Chondrocyte Response to Supplemented Aggrecan and Chondroitin Sulfate

### Sara Darnold (Dr. Ozturk)

Phenolic Compounds in Castoreum

### Jennifer Fletcher (Dr. Jennings)

Sweet Stress? A Study of The Relationship between Saccharin Exposure and Corticosterone Levels in Mice

### Aimee Jackson (Dr. Jennings)

The Effect of Notch and Epidermal Growth Factor Receptor on *Triops longicaudatus*

### Kyle Kruse (Dr. Ozturk)

Correlation of Computational Modeling of Borate and Borosulfide Glasses

### Hugo Nieto (Dr. Schutzenhofer)

Effects of Competition on Congeneric Rare and Common *Lespedeza*

### Kamara Owens (Dr. Schutzenhofer)

Influence of Human Foot Traffic on Pollinator Visitation Rates for Lantana (*Lantana camara*)

### Ramona Puskar\* (Dr. Schutzenhofer)

The Effect of Environmental Enrichment on the Foraging Behavior of Garter Snakes (*Thamnophis sirtalis*)

### Dan VanNatta\* (Dr. Jennings)

Application of MacArthur-Wilson Biogeography Theory to Isolated Tree Habitats

## Upcoming Classes – Fall 2009

### Biological Science

- Genetics (BIO 211) - TBA
- General Ecology (BIO 303) – Dr. Schutzenhofer
- Field Botany (BIO 325) – Dr. Schutzenhofer
- Comparative Vertebrate Anatomy (BIO 420) – Dr. Jennings

### Chemistry

- Organic Chemistry (CHE 250) – Dr. Reese
- Biochemistry (CHE 305) – Dr. Ozturk

### Physical Science

- General Physics I Mechanics (PHY 210) – Dr. LaVigne
- Introduction to Astronomy (PHY 101) – Dr. LaVigne
- Introductions to Earth Science (ES 105) – Dr. LaVigne
- Earth and Astronomical Sciences (SCE 205) – Ms. Fawcett

## Calendar

### MAY

- 8<sup>th</sup> – Full Moon
- 9<sup>th</sup> – Commencement
- 10<sup>th</sup> – Mother's Day
- 17<sup>th</sup> – Look for butterflies at mud puddles
- 21<sup>st</sup> – Tulip Poplar Trees bloom
- 25<sup>th</sup> – Memorial Day

\*\*Register for Fall Classes!\*\*

### JUNE

- 5<sup>th</sup> – Wonders of Wildlife (WOW) 2009 at Forest Park, St. Louis + SLSC Planetarium Public Telescope Night!
- 7<sup>th</sup> – Purple Coneflowers blooming. Full Moon
- 13<sup>th</sup> – Chicory blooming on roadsides
- 21<sup>st</sup> – Summer Solstice
- 23<sup>rd</sup> – Watch for turtles on roadway



### JULY

- 1<sup>st</sup> – Look for lizards basking in the sun
- 5<sup>th</sup> – Winged Sumac blooming
- 7<sup>th</sup> – Penumbral Lunar Eclipse. (Maximum at 09:37 GMT)
- 18<sup>th</sup> – Blackberries! Chiggers!
- 23<sup>rd</sup> – Screech Owls vocal
- 31<sup>st</sup> – Monarch Butterflies increasing

### AUGUST

- 5<sup>th</sup> – Full Moon
- 6<sup>th</sup> – Swamp Milkweed in bloom in ditches
- 8<sup>th</sup> – Big Bluestem blooming
- 12<sup>th</sup> – Perseid Meteor Shower
- 19<sup>th</sup> – Missouri Ironweed in bloom
- 24<sup>th</sup> – First Day of Fall Classes
- 25<sup>th</sup> – Listen for Eastern Screech Owls
- 27<sup>th</sup> – Watch for flocks of up to 100 migrating Nighthawks