Kentucky Academy of Science

NEWSLETTER

The Voice of Science in Kentucky

www.kyscience.org | Susan Templeton, Editor | January 2014

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Faculty, staff and students at Enhanced Affiliate member organizations receive:

- ***free KAS membership***
- ***online access to KAS Journal***
- ***KAS Newsletter via e-mail***

The KAS Newsletter is published in January, May and August. Current and archived issues are available at www.kyscience.org. You may contact the Editor of the KAS Newsletter via e-mail at susan.templeton@kysu.edu.

Editor's Note: When viewing the Newsletter in Acrobat Reader the Table of Contents (TOC) contains live links to each article; at the bottom right of each page is a link back to the TOC!

From the President...

I am truly humbled by the opportunity to serve as President of the Kentucky Academy of Science for 2014. This year we celebrate the academy's 100th anniversary. From its modest beginnings in 1914, with only 60 participants, the academy's membership has grown to over 2,600 individuals.

In November of last year the annual meeting was our largest and perhaps most successful to date, with nearly 800 participants, including over 450 oral and poster presentations. The theme of the both the symposium and plenary lecture focused on water resources in Kentucky and globally. The symposium, "Citizens and Scientists Protecting Kentucky Water," featured three short presentations by Amanda Gumbert from the UK Cooperative Extension Service - KY Division of Conservation, Ken Cooke who works with the volunteer organization Friends of Wolf Run Inc,. and Tim Joice the Water Policy Director for the Kentucky Waterways Alliance. The extremely successful symposium was given to a standing room only audience. The Plenary Lecture was given by Dr. Chris Groves, Distinguished Professor of Hydrogeology and Director of the Hoffman Environmental Research Institute. His presentation, "Living on Karst Landscapes in Kentucky and Throughout the World," also saw a standing room only audience. Because of the growing nature of our annual meetings and the centennial celebration, the decision was made to hold this year's meeting at the Lexington Convention Center. The meeting will also be expanded over three days, November 14 -16. Lexington was the home of the first KAS meeting.

There were several personnel changes within the Board in 2013. Melony Stambaugh did a remarkable job as the new program coordinator after our coordinator of 16 years, Bob Creek, stepped down. Last year also saw the departure of our Executive Director for the last eight years, Jeanne Harris. Although, she started before last year's annual meeting I would like to welcome our new Executive Director, Amanda Fuller. Special thanks are given to our Past President Cheryl Davis, not only for her strong leadership last year, but also because Cheryl had to simultaneously serve both the role of President and Executive Director for several months last year, during the transition time between the departure of Jeanne and the hiring of Amanda. Another change moving into 2014 is our treasurer. After many years of dedicated service, Ken Crawford has left and I would like to welcome our new treasurer, Rodney King. This year also saw a new Editor for the JKAS, Jerzy Jaromczyk. I would like to thank all of our past and current Governing Board members for their service. *(Continued on page 7)*

Inside this issue

2013 Annual Meeting Report

The 2013 KAS Annual Meeting was held on November 8-9, 2013. The 99th Annual Meeting was hosted by Morehead State University in Morehead, Kentucky. There were 838 participants who registered, including more than 500 students; 380 banquet tickets sold; and 478 abstracts (233 Oral presentations, 245 Posters) were submitted.

Section	Total Abstracts	Orals	Posters
Agricultural Sciences	32	20	12
Anthropology and Sociology	9	8	1
Botany	12	7	5
Cellular and Molecular Biology	41	9	32
Chemistry: Analytical/Physical	25	9	16
Chemistry: Organic/Inorganic	42	15	27
Computer and Information Sciences	17	17	0
Ecology and Environmental Science	60	24	36
Engineering	19	14	5
Geography	6	5	1
Geology	13	12	1
Health Sciences	17	8	9
Mathematics	14	14	0
Microbiology	16	5	11
Physics and Astronomy	29	14	15
Physiology and Biochemistry	40	15	25
Psychology	42	16	26
Science Education	23	15	8
Zoology	21	6	15
Total	**478**	**233**	**245**

2013 KAS Annual Meeting Sponsors

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EXHIBITORS

UK PhD Program in Pharmaceutical Sciences

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KBRIN – Kentucky Biomedical Research Infrastructure Network

Sapling Learning

University of Louisville Integrated Programs in Biomedical Sciences

EKU CRAFT (Center for Renewable and Alternate Fuel Technologies)

UK Integrated Biomedical Science

Murray State College of Science, Engineering and Technology

UK Department of Chemistry

UK Center for Applied Energy research

WKU Ogden College of Science and Engineering

Kentucky Bridge to a Biomedical Doctorate for Appalachian Students

Waters Corporation

Submitted by Amanda Fuller, Executive Director

Messages from the Executive Director

It was great fun meeting so many of our members and other scientists at the record-breaking Annual Meeting in Morehead. I am impressed and excited to work with you all – and I am thankful to many of you who have helped make my transition as smooth as possible.

Tracking funding opportunities

In addition to KAS' own Research grants we can try to share others we know of and connect collaborators via the Academy! Here are a couple of better-known sources:

Grants.gov : Every week I get an email from grants.gov with a list of open grant opportunities through federal agencies. If you'd like to get these announcements weekly, you can subscribe at grants.gov with specific criteria; You can also search opportunities anytime at their website:

http://www.grants.gov/web/grants/home.html

The Kentucky Science & Engineering Foundation is another site where you can follow open opportunities. They have several different grant programs and offer workshops on Proposal Development.

http://ksef.kstc.com/

Membership Inquiry coming your way

We know you are interested in helping the Academy be more visible in promoting science and science education in the state. Watch your mailbox and please fill out our upcoming Membership Survey so we can gauge your interest in…

- Serving on a committee (Science Education, Public Relations, Legislation, Membership, Awards, or Distribution of Research Funds)
- Volunteering on one day a year for a Science Education event or mentoring aspiring scientists in your discipline or in a location near you
- Serving as a judge for a research competition in your section at the Annual Meeting
- Serving as a judge for the Junior Academy competition in April

Together we are raising a louder voice for Science in Kentucky!

New Office and Partnership

One thing I am excited about is our new partnership with the Kentucky Science Center. KAS will be serving as experts and advisors for the Science Center's exhibits and programs, in Louisville and around the state. In exchange, I have an office in the Science Center at 8th and Main in downtown Louisville – come by and say hi if you are in the neighborhood!

Kentucky Academy of Science
727 W. Main St.
Louisville, KY 40202

This partnership means we can bring science to more people and share exciting work our scientists are doing. And YOU can help excite more youth and adults about science (and have some fun...) lending a hand with some of the events and programs.

I am creating a directory of KAS members who are interested in being called upon when there are programs happening near them or in their field. Please get in touch with me (executivedirector@kyscience.org; 859-227-2837) if you would consider serving as an expert and would like more information. No firm commitment is necessary now—I will send you more info if you are interested. Some opportunities are available for students too. Here's how we can help the Science Center:

- Reviewing program scripts, classroom curriculum, and exhibit label copy for scientific accuracy (about 12 x per year)
- Volunteering to help with four *Youth Science Summits* annually (Louisville and Lexington each June; Paducah March 22, Northern Kentucky TBD). Participation can take many forms and time commitment from presenting 90-minute interactive labs several times throughout the day, to a half-day commitment for speed mentoring. We'll need six to twelve volunteers for each event. (skyping in is ok)
- Help with 5 annual Science Celebrations. These one to three-day long events bring scientists and technicians from around the state to showcase their research, products, & services to KSC visitors in Louisville.
- Provide volunteers to participate in our *Scientific Proofs* Adult Lecture Series. *Proofs* brings together a panel of experts representing a varied opinion on a STEM topic of interest or controversy to discuss the issue and engage in conversation with participants. *Proofs* occur both as live events at KSC, or as podcasts (taped at the expert's office, classroom or lab) and are held several evenings throughout the year.
- Other programs! We have a variety of ideas about members-only lectures & tours, collaborations with the Junior Academy, Kentucky Natural History Survey/ Discover Life initiative, and membership benefits for both organizations. We see this relationship evolving with our own interest & capacity to help.

Amanda Fuller, Executive Director
Kentucky Academy of Science
executivedirector@kyscience.org

KENTUCKY SCIENCE CENTER
LOUISVILLE, KENTUCKY

Partners Needed for the Kentucky Science Center

***New!!* Paducah Youth Science Summit, Saturday March 22.**

In partnership with the Kentucky Science Center, we will help present the Youth Science Summit at the West Kentucky Community & Technical College campus.

We are looking for 6-12 people to help which might include:

- Presenting 90-minute interactive labs several times throughout the day (via Skype is ok); or
- Half-day commitment for speed mentoring.

Undergraduate and graduate students are welcome! We will have about 100-120 middle and high school science students, and we are looking for scientists from any and all disciplines to share YOUR work and career with them.

If you're tentatively interested please email Amana Fuller at executivedirector@kyscience.org or call 859-227-2837 and leave me your contact information. Please share with others who might be interested.

Science Celebrations are theme parties at the Kentucky Science Center that allow for community partners to share their work & research with our visitors. Through tabletop activities, technology showcases, presentations, and more these events allow you to your share STEM careers with visitors of all ages. This Spring we have two exciting opportunities:

DNA Day- Friday April 25 10:00-2:00

Perfect for lab professionals, medical researchers, or businesses that provide biomedical services. Audience will be largely students at the Science Center on field trips.

Space Day- Saturday May 10 11:00-4:00

A great opportunity for engineers, mathematicians, and technologists. Any STEM connection to space is welcome! This event will also be set against the backdrop of Earth Science Month, so geological connections are also encouraged. Audience will be largely families of all ages in small groups.

What can I do? The most common type of partner program for a Science Celebration is a table-top activity with a volunteer to share a brief hands-on lesson. Our gallery spaces can facilitate a wide variety of footprints and we also can provide electricity and wireless connectivity. We also have larger scale presentation spaces and labs within the galleries for more in depth experiences. Also, we welcome presentations via our Distance Learning (Polycom) and SKYPE systems—so participants from all over the globe are welcome!

What do I do to sign up? Simply contact Amanda Fuller, KAS Executive Director, at executivedirector@kyscience.org, or Andrew Spence, Visitor Experience Coordinator at Andrew.spence@louisvilleky.gov or (502) 560-7129 to sign up for either event. Be sure to mention you heard about this from KAS! As the dates approach, Andrew will email you all the necessary logistical information such as the parking lot code. All partners that participate in this event will receive free parking and a pass of a free follow-up visit to the exhibits.

2014 KAS Grant Awards

The Committee on Distribution of Research Funds reviewed 37 proposals this year. Chairman George Antonious presented their recommendations to the February meeting of the KAS Governing Board, and the Board approved the following awards:

SPECIAL RESEARCH - Terry Derting, Murray State University: Occurrence of mammalian prey and scavengers on potential re-introduction sites for *Nicrophorus americanus* [American burying Beetles] at Land-Between-the-Lakes National Recreational Area.

MARCIA ATHEY & BOTANY - 1) Paul Hime/David Weisrock (Faculty), University of Kentucky: Leveraging genomics to understand and conserve the critically endangered Ozark hellbender salamander. 2) Mason Murphy/David Weisrock (Faculty)/Steven Price (Faculty), University of Kentucky: Dispersal congruency and population structure within an imperiled host-parasite system. 3) Stephen Richter (Faculty)/Chelsea Kross, Eastern Kentucky University: Effects of interactions between *Notophthalmus viridescens* and *Lithobates sylvaticus* in a ridge-top wetland ecosystem.

UNDERGRADUATE RESEARCH - 1) Megan Radenhousen, Centre College: Facilitating adjustment to college for students of color: An experimental study of a mentoring intervention. 2) Yuwei Tsai/Amanda Bowman (Faculty), Transylvania: Effects of pH and salinity on the migration of Bisphenol A from coatings of epoxy food cans under room temperature. 3) John Carmen (Faculty)/Yasmeen Daher, Northern Kentucky University: Assessing the activity of a novel thiazole containing icrocyclamide against clinically important Candida species. 4) Garrett Gabhar/Martha Mazur (Faculty), Bellarmine University: Industrial discharges of dissolved metals in Ohio River tributaries and consequential effects on benthic macroinvertebrate communities.

2013 Undergraduate Research Competition Winners

Congratulations to these students and their mentors, and thanks to those who devoted their time to judge the presentations.

Agricultural Sciences
- Oral 1st: Doug Blair - Kentucky State Univ.
- Oral 2nd: Elizabeth Pettyjohn-Thrall - Murray State U.
- Oral 3rd: Hannah Robbins - Murray State Univ.
- Poster 1st: Caitlin Thomas - Berea College
- Poster 2nd: Andrew Rosselot - Wittenberg Univ.
- Poster 3rd: Gregory E. Shanley - Morehead State Univ.

Anthropology and Sociology
- Oral 1st: Vanya Bistrekova - Univ. of Kentucky
- Oral 2nd: Bill Beckerson - Georgetown College
- Oral 3rd: Jayme Thomas - Georgetown College
- Poster 1st: Alexandra Ivers - Northern Kentucky Univ.

Botany
- Oral 1st: Kelly Modaff - Morehead State Univ.
- Oral 1st: Samantha G. Thomas - Murray State Univ.
- Oral 3rd: Han Ly - Alice Lloyd College
- Poster 1st: Rebecca Graves - Kentucky State Univ.
- Poster 2nd: Benjamin Rasp - Morehead State Univ.
- Poster 3rd: Victoria Evans - Morehead State Univ.

Cellular and Molecular Biology
- Oral 1st: Taylor Rutherford - Berea College
- Oral 2nd: Shanequa Roscoe - Berea College
- Oral 3rd: Franceska Mehmeti - Berea College
- Poster 1st: William Assan - Berea College
- Poster 2nd: Sarah Bugg - Centre College
- Poster 3rd: Cameron Campbell - Campbellsville Univ.

Chemistry: Analytical / Physical
- Oral 1st: Michael Bale - Univ. of Kentucky
- Oral 2nd: Pyae Phyo - Berea College
- Oral 3rd: Kathryn Renyer - Morehead State Univ.
- Poster 1st: Krista Loose - Northern Kentucky Univ.
- Poster 2nd: Isaac J. Kresse - Western Kentucky Univ.
- Poster 3rd: Armanda Pennington - Eastern Kentucky Univ.

Chemistry: Organic / Inorganic
- Oral 1st: Thuy (Donna) Do - Northern Ky Univ.
- Oral 2nd: Louis Rodgers - Centre College
- Oral 3rd: Michael McCann - Berea College
- Poster 1st: Brad Cundiff - Georgetown College
- Poster 2nd: Hannah Hearn - Northern Kentucky Univ.
- Poster 3rd: Benjamin Shaw - Eastern Kentucky Univ.

Computer and Information Sciences
- Oral 1st: Jorge Chang - Morehead State Univ.
- Oral 2nd: Bryan Knowles - Western Kentucky Univ.
- Oral 3rd: Zachary Lamb - Morehead State Univ.

Ecology and Environmental Science
- Oral 1st: Leif Van Laar - Berea College
- Oral 2nd: Trent Roberts - Northern Kentucky Univ.
- Poster 1st: Ryan N. Vincent - Western Kentucky Univ.
- Poster 2nd: Sarah Hayley Shaw - Northern Kentucky U.
- Poster 3rd: Benjamin Adams - Asbury Univ.

Engineering
- Oral 1st: Kien T. Dang - Morehead State Univ.
- Oral 2nd: William T. Roach-Barrett - Morehead State Univ.
- Oral 3rd: Zach Taulbee - Morehead State Univ.
- Poster 1st: Denzell Barnett - Berea College
- Poster 2nd: Nolan Mark - Murray State Univ.
- Poster 3rd: Robert Spencer - Morehead State Univ.

Geology
- Oral 1st: Jessica Damron - Northern Kentucky Univ.
- Oral 2nd: Kandice L. Smith - Eastern Kentucky Univ.
- Oral 3rd: Richard M. Burnworth - Western Ky Univ.
- Poster 1st: Sarah Lott - Northern Kentucky Univ.

Health Sciences
- Oral 1st: Victoria Mathis - Kentucky State Univ.
- Oral 2nd: Addie Dodson - Western Kentucky Univ.
- Oral 3rd: Rachael Cicci - Northern Kentucky Univ.
- Poster 1st: Sean Shumate - Northern Kentucky Univ.
- Poster 2nd: Audrey C. Brown - Western Kentucky Univ.
- Poster 3rd: Amber Boothe - Berea College

Mathematics
- Oral 1st: Matthew Fahrbach - Univ. of Kentucky
- Oral 2nd: Emily Adams - Morehead State Univ.
- Oral 3rd: Stephanie Hagan - Western Kentucky Univ.

Microbiology
- Oral 1st: Brooke Johnson - Eastern Kentucky Univ.
- Oral 2nd: Charles Coomer - Western Kentucky Univ.
- Oral 3rd: Kelsey Carter - Western Kentucky Univ.
- Poster 1st: Travis A. Witkowski - Morehead State U.
- Poster 2nd: Alyssa Huff - Western Kentucky Univ.
- Poster 3rd: Hannah Rodgers - Western Kentucky Univ.

Physics and Astronomy
- Oral 1st: Danielle C. Schaper - Berea College
- Oral 2nd: Kyle Godbey - Berea College
- Oral 3rd: Mary Spraggs - Western Kentucky Univ.
- Poster 1st: Alekzander Kosakowski - Morehead State Univ.
- Poster 2nd: Preston Tucker - Berea College
- Poster 3rd: Keith Andrew - Western Kentucky Univ.

Physiology and Biochemistry
- Oral 1st: Matthew Stark - Northern Kentucky Univ.
- Oral 2nd: Brandon Farmer - Western Kentucky Univ.
- Oral 3rd: Makenna Williams - Georgetown College
- Poster 1st: Esraa A. Abdeljaber - Univ. of Kentucky
- Poster 2nd: Clara deCastro - Univ. of Kentucky
- Poster 3rd: Sarah McClanahan - Morehead State Univ.

Psychology
- Oral 1st: Priyanka Srestha - Berea College
- Oral 2nd: Paige Baechle - Centre College
- Oral 3rd: Sloane Weed - Centre College
- Poster 1st: Justine Griesenauer - Morehead State Univ.
- Poster 2nd: Kimberly Ellison - Eastern Kentucky Univ.
- Poster 3rd: Rachele Johnson - Berea College

Science Education
- Oral 1st: Kevin Beers - Northern Kentucky Univ.
- Oral 2nd: Sarah M. Francis - Morehead State Univ.
- Oral 3rd: Janie L. Knell - Morehead State Univ.
- Poster 1st: Joshua Wedding - Berea College
- Poster 2nd: Nicole Bashall - Northern Kentucky Univ.
- Poster 3rd: William S. Cornacchion - Wittenberg Univ.

Zoology
- Oral 1st: Brooke Washburn - Morehead State Univ.
- Oral 2nd: Brittany Jones - Northern Kentucky Univ.
- Oral 3rd: Wesley Parsons - Northern Kentucky Univ.
- Poster 1st: Morgan Murrell - Western Kentucky Univ.
- Poster 2nd: Caroline Matchett - Wittenberg Univ.
- Poster 3rd: Caitlin Dresing - Campbellsville Univ.

Submitted by Amanda Fuller, Executive Director

2013 Graduate Research Competition Winners

Congratulations to these students and their mentors, and thanks to those who devoted their time to judge these oral presentations.

Agricultural Sciences
1st: Alex Squadrito - Kentucky State University
2nd: Richard Bryant - Kentucky State University
3rd: Jon Cambron - Kentucky State University

Cellular and Molecular Biology
1st: Erik Korte - University of Louisville
2nd: Sanaya F. Bamji - University of Louisville
3rd: Yanyan Lin - Murray State University

Chemistry: Analytical / Physical
1st: Yunxin Liao - Eastern Kentucky University
2nd: Shashidhar Annarapu - Western Kentucky University
3rd: Yogesh Kherde - Western Kentucky University

Chemistry: Organic / Inorganic
1st: Bidhya Maharjan - University of Kentucky
2nd: Surya Banks - University of Kentucky
3rd: Deepshikha Gupta - University of Kentucky

Computer and Information Sciences
1st (tie): Darryl D'Souza and Abdallah M. Eteleeb - U of L
2nd: Hanqing Hu - University of Louisville
3rd (tie): Daniel R. Harris - U of K and Marc Beck - U of L

Ecology and Environmental Science
1st: Daniel Starnes - University of Kentucky
2nd: Persons - University of Louisville
3rd: Nicholas A. Levis - Western Kentucky University

Engineering
1st: Nadeera Ekanayake - Morehead State University
2nd: Raghava Davuluri - University of Kentucky
3rd: Mychal Drew-Moses - Western Kentucky University

Geography
1st (tie): Elizabeth Tyrie - Western Kentucky University and Veronica Hall - Western Kentucky University

Geology
1st: Jennifer D. Martin - Murray State University

Health Sciences
1st: Stephen Wechman - University of Louisville
2nd: Ben Cheruiyot - Eastern Kentucky University

Mathematics
1st: Patrick Trainor - University of Louisville

Microbiology
1st: Emily D'Angelo - Murray State University
2nd: Jiashuo Ma - Kentucky State University

Physiology and Biochemistry
1st: Cui Ye - University of Kentucky
2nd: Zana R. Majeed - University of Kentucky
3rd: Smita Joshi - University of Kentucky

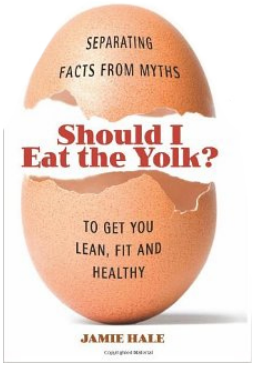
Psychology
1st: Tao Jiang - Eastern Kentucky University

Science Education
1st: Bharath Sampath Kumar - University of Kentucky
2nd: Josh Titlow - University of Kentucky
3rd: Daniel W. Burton - Morehead State University

Zoology
1st: Jacob Fose - Western Kentucky University
2nd: Kayla Pittman - Western Kentucky University
3rd: Scott Hotaling - University of Kentucky

Submitted by Amanda Fuller, Executive Director

KAS Author's Corner



Jamie Hale, ***Should I Eat the Yolk? Separating Facts from Myths to Get You Lean, Fit and Healthy***, Ulysses Press, 2010, ISBN: 978-1-56975-790-1.

Jamie Hale earned an MS in Experimental Psychology specializing in Behavioral Nutrition and Cognitive Science. He is associated with associated with Eastern Kentucky University's Perception & Cognition lab and Psychophysiology lab, and has been a Teaching Facilitator there in Research Methods and Statistics, Health Psychology, and Cognitive Psychology. He currently serves on the Board of Directors- Kentucky Council Against Health Fraud. www.kcahf.org

This handy guide gives you real answers to many common health and fitness claims. Plus, it provides the scientific evidence that separates the fact from fiction for every question, like:

- Does everyone need to drink at least 8 glasses of water per day?
- Do high-protein diets increase the risk of coronary heart disease?
- Are all calories created equal?
- Will performing sit-ups shrink my waistline?
- Will exercise get rid of cellulite?
- Does calcium intake enhance weight loss?
- Is bottled water safer to drink than tap water?
- Does eating grapefruit speed up fat loss?

Available at Amazon.com (http://www.amazon.com/Should-Eat-Yolk-Separating-Healthy/dp/1569757909).

Author Information Wanted!

If you are a KAS member and have recently published a science focused book please forward this information to the KAS newsletter editor (susan.templeton@kysu.edu) so that your accomplishment can be shared with other scientists in Kentucky. KAS promotes the dissemination of the scientific interests of the Commonwealth of Kentucky. We look forward to hearing from you!

KAS Governing Board Updates

The Nominations and Elections Committee congratulates those who were elected to office and expresses sincere appreciation to all those willing to serve the Academy by allowing their names to be placed into nomination.

Newly elected Board Members:

- Vice President Eric Jerde (Morehead State)
- Treasurer Rodney King (Western Ky University)
- Biological Sciences Rep. Chris Adams (Morehead)
- At-Large Rep. Mary Janssen (Madisonville CC)

Taking office for 2014:

- KAS President;KC Russell (Northern Ky University)
- President-Elect David White (Murray State)
- Past President Cheryl Davis (Western Ky University)

Continuing Board Members:

- Secretary Robert Kingsolver (Bellarmine)
- At-Large Rep. KatieAnn Skogsberg (Centre)
- Biological Sciences Rep. Pamela Feldhoff (U of L)
- Physical Sciences Rep. R. Douglas Chatham (Morehead)
- Social & Behavioral Sci. Rep. Judy Voelker (Northern)
- Social & Behavioral Sci. Rep. David Butz (Morehead)

Ex-officio Board Members:

- Executive Director Amanda Fuller
- Program Coordinator Melony Stambaugh
- Junior Academy of Science Director Ruth Beattie (UK)
- AAAS/NAAS Representative Nancy Martin (U of L)
- Journal Editor Jerzy Jaromczyk (UK)
- Webpage Editor Claire Rinehart (Western)
- Newsletter Editor Susan Templeton (Kentucky State)
- Executive Secretary Emeritus Don Frasier (UK)

Retiring Board Members:

- Biological Sciences Rep. Ron Jones (Eastern)
- Treasurer Ken Crawford (Western)
-

Retiring board members were recognized for their service to KAS by President Cheryl Davis at the Kentucky Academy of Science Annual Business Meeting on November 9th, 2013.

Note: A Physical Sciences Representative seat was made vacant by the election of Eric Jerde as Vice President. KAS President KC Russell will appoint an interim representative to serve out his term.

Submitted Amanda Fuller, Executive Director

From the President...continued

I believe that the academy is a transformational period and will continue to expand its role and visibility in the Commonwealth. We are already beginning to foster new relationships. Thanks to the diligent work of our Executive Director, the academy has a new home. We now have an office located in the Kentucky Science Center in Louisville. In an agreement with the Science Center, we are provided office space in return for periodically sharing our scientific expertise. Our first board meeting of 2014 was held at the Science Center. We have an agreement with the aquarium in Newport, KY that gives KAS members a discount on admission. We are making efforts to expand our media presence with a new Facebook page and a Twitter account. Thanks to the work of Jerzy Jaromczyk, the entire editorial process for the Journal of the Kentucky Academy of Science is now on line. Under the leadership of Ron Jones and Judy Volker the academy is playing a central role in the Kentucky Natural History Survey. These examples are only a beginning. They represent only a few possible opportunities to better serve both the current members of the KAS and engage the community at large.

While the academy clearly has many successes to be proud of, we still face challenges. We will continue to support good science and education in our schools, including the Next Generation Science Standards. Within the academy, we see that some disciplines are not well represented at our annual meeting and the representation at the Kentucky Junior Academy of Science meeting could be better across the Commonwealth. As an organization, I look forward to some self-assessment and strategic planning so that the KAS may become even more efficient and impactful.

I look forward to this year with much enthusiasm. But it will take all of us to make this organization truly flourish. I ask all members to consider what you might be able to contribute in service to KAS, whether it be volunteering at a KAS event, giving a lecture on behalf of the KAS, making us aware of events that we may share, nominating someone for a superlative award, or serving as a Governing Board member or filling one of the open committee positions. If each member did just one thing to support the academy the impact would be significant.

I strongly believe the key to being successful begins with communication and listening. Please do not hesitate to contact me if you have any questions, concerns, or suggestions. I look forward to working with all of you. Together, let's make 2014 a year for the academy to remember!

KC Russell
russellk@nku.edu

2014 KAS Sectional Officers

Section	Chair	Secretary
Agricultural Sciences	Hideka Kobayashi hideka.kobayashi@kysu.edu	Michael Bomford michael.bomford@kysu.edu
Anthropology and Sociology	Benjamin Freed Benjamin.Freed@eku.edu	Andrew Deane andrew.deane@uky.edu
Botany	Brad Ruhfel brad.ruhfel@eku.edu	
Cellular and Molecular Biology	Chris Trzepacz ctrzepacz@murraystate.edu	Dawn Anderson dawn_anderson@berea.edu
Chemistry : Analytical / Physical	Pei Gao pei.gao@eku.edu	William Stevens wstevens@kcu.edu
Chemistry : Organic / Inorganic	Buchang Shi buchang.shi@eku.edu	Mary Garrett garrettm@berea.edu
Computer and Information Sciences	Jerzy Jaromczyk jurek@cs.uky.edu	Sherif Rashad s.rashad@moreheadstate.edu
Ecology and Environmental Science	Stephen Yanoviak steve.yanoviak@louisville.edu	
Engineering	Nilesh Joshi n.joshi@moreheadstate.edu	Sanjeev Adhikari s.adhikari@moreheadstate.edu
Geography	Leslie North leslie.north@wku.edu	Jason Polk jason.polk@wku.edu
Geology	Charles Mason c.mason@moreheadstate.edu	Frank Ettensohn fettens@uky.edu
Health Sciences	Lingyu Huang lingyu.huang@kysu.edu	Avinash Tope Avinash.tope@kysu.edu
Mathematics	John Porter ted.porter@murraystate.edu	R. Douglas Chatham d.chatham@moreheadstate.edu
Microbiology	Cangliang Shen cangliang.shen@wku.edu	Geoff Gearner g.gearner@moreheadstate.edu
Physics and Astronomy	Keith Andrew Keith.Andrew@wku.edu	Robert Arts RobertArts@upike.edu
Physiology and Biochemistry	Michael Fultz m.fultz@moreheadstate.edu	Sarah Blank sarah.blank@kctcs.edu
Psychology	David Porter david_porter@berea.edu	David Butz d.butz@moreheadstate.edu
Science Education	Bill Staddon bill.staddon@eku.edu	Marilyn Akins marilyn.akins@kctcs.edu
Zoology	Noah Ashley noah.ashley@wku.edu	Philip Lienesch philip.lienesch@wku.edu

Submitted by Amanda Fuller, Executive Director

2013 Superlative Awards

OUTSTANDING COLLEGE/UNIVERSITY TEACHER

Dr. Cheryl Davis, KAS President, presented Dr. Megan Hoffman of Berea College the award plaque.

Dr. Megan Hoffman's professional life has focused on biology education with over 20 years of college classroom teaching. Her vocation began when she served as an undergraduate biology teaching assistant at Dartmouth College. After earning her Ph.D. in 1990 in biological and neural sciences from Washington University, she completed a teaching and research post-doctoral fellowship at Bryn Mawr College. Since arriving at Berea College in 1994, she has taught a variety of courses, primarily introductory and upper-level biology and the General Education Curriculum. She has also been active in campus governance and served for four years as director of The Center for Learning, Teaching, Communication, and Research. She has been involved in the professional development of a significant proportion of the Berea teaching faculty and has served as academic advisor, labor supervisor, and research mentor for decades of Berea students. She is actively involved in the POGIL Project (Process Oriented Guided Inquiry Learning), an organization with a mission "to connect and support educators from all disciplines interested in implementing, improving, and studying student-centered pedagogies and learning environments". She has served the Project as a member of the steering committee, as the biology content editor for classroom materials developed by the High School POGIL Initiative, and as designer and facilitator of regional and national workshops. In 1994, she stood in front of the class and talked to students. Students sat in rows, taking notes, occasionally asking questions and even more occasionally, answering them - teaching happened. Now she listens rather than lectures. Students sit in small groups, discussing with one another, pointing out areas of interest in the complex biology images, and puzzling through new material together - learning happens. The main impetus for this change has been the adoption of the POGIL approach. The use of this approach in the classroom dramatically changes the tenor of the class: rather than one voice, there are dozens of voices as students discuss, explain, and argue. Research shows that they are learning more effectively as well. The recent changes to her pedagogical approach have been accompanied by a shift in her scholarly interests. She is now involved in the scholar-ship of teaching and learning, including investigations into the effectiveness of the POGIL approach in introductory biology classes.

OUTSTANDING EARLY CAREER IN POST SECONDARY EDUCATION

Dr. Roman V. Yampolskiy, Professor of Computer Engineering and Computer Science at the University of Louisville, holds a Ph.D. degree from the Department of Computer Science and Engineering at the University at Buffalo, where he was a recipient of a four year NSF fellowship. Previously, he received a BS/MS in Computer Science from Rochester Institute of Technology. He also held a position of an Affiliate Academic at the Center for Advanced Spatial Analysis, University of London, College of London. In 2008 he became an assistant professor at the Speed School of Engineering at U of L. He is an alumnus of Singularity University (GSP2012) and was a visiting fellow of the Singularity Institute. Dr. Yampolskiy's main areas of interest are behavioral biometrics, digital forensics, pattern recognition, genetic algorithms, neural networks, artificial intelligence and games. He is an author of over 100 publications including multiple journal articles and books; his research has been cited by numerous scientists and profiled in popular magazines both American and foreign, on dozens of websites, and on radio, attracting international attention. His students have chosen him as the 2010, 2011, 2012 and 2013 "Faculty Favorite", 2010-2011 "Top 11" faculty at the University of Louisville, and 2012 "of the Year". In 2013 a committee of professors from universities across the nation recognized him as a Top 10 "Online College Professor of the Year." To date, he has been an instructor (or TA) for 10 different courses at three different universities (two public, one private). He has lectured, taught labs and recitations for graduate and undergraduate courses, small seminars with just a dozen of students as well as large courses with as many as 160 students. He has designed new courses and modified existing ones. He experienced working with advanced CS students and with non-majors who are typically not very enthusiastic about computer science. In addition to general introductory courses in computer science he has also taught courses in Artificial Intelligence, Forensics, and Engineering Design.

President Cheryl Davis presents Dr. Roman Yampolskiy of U of L with the award plaque.

OUTSTANDING ACADEMY SERVICE

The recipient of the 2013 Outstanding Academy Service Award is Dr. William H. Martin. Dr. Martin was Director of the Division of Natural Areas and Professor of Biology at Eastern Kentucky University until his retirement in 2005 after more than 35 years of service to the university. From 1992-1998, he served as Commissioner of the Kentucky Department for Natural Resources. He received a Ph.D. from the University of Tennessee-Knoxville in 1971. His research interests were and remain the composition and dynamics of forests and grasslands of the southern Appalachians and Midwest. At Eastern, he developed and taught a number of graduate and undergraduate courses in ecology as well as courses in environmental ethics and surface mine reclamation. As Commissioner of the Kentucky Department for Natural Resources, he was responsible for the Divisions of Forestry, Energy, and Conservation and served as representative of the Natural Resources and Environmental Protection Cabinet on the Kentucky River Authority. He was a lead member of the teams that developed and successfully passed the 1994 Kentucky Heritage Land Conservation Fund and Board Act and the 1998 Kentucky Forest Conservation Act. He also served as the co-chair of the 1995 Biodiversity Task Force. He has authored several scientific papers with emphasis on old-growth forests and he was senior editor of the award-winning three-volume series, Biodiversity of the Southeastern United States (1993). He belongs to a number of professional organizations including the Ecological Society of America and the Kentucky Academy of Sciences. He is past president of the Association of Southeastern Biologists and the Southern Appalachian Botanical Society. He has served as a consultant to the U.S. National Park Service, the U.S. Forest Service, the Tennessee Valley Authority, and The Nature Conservancy regarding a number of forest, conservation, and resource management issues. Previous awards include the 1995 Distinguished Service Award of the Kentucky Association of Conservation Districts; the 1996 Public Servant Award of the Kentucky Environmental Quality Commission; and the 2006 Biological Diversity Protection Award of the Kentucky State Nature Preserves Commission. The Southern Appalachian Botanical Society designated him as the 2002 recipient of the Elizabeth Ann Bartholomew Award for "distinguished service to botany and the public, " and the Center for Biological Studies at Western Kentucky University presented him the award for a lifetime contribution to the conservation and study of biodiversity (2002). Dr. Martin served as the Chairman of the Kentucky Heritage Land Conservation Fund Board from its establishment in 1994 until 2013. He also served on the Lexington-Fayette Urban County Government's Greenspace Commission and terms as a board member of the Kentucky Chapter of the Nature Conservancy, the Kentucky Conservation Committee, the Kentucky Chapter of the American Chestnut Foundation, and the Virginia 500-Year Forest Foundation.

Call for Nominations for Superlative Awards

The Kentucky Academy of Science seeks nominations of individuals who have made outstanding contributions to scientific research and education in the Commonwealth in the six areas designated below.

- Outstanding Academy Service
- Distinguished College/University Scientist
- Outstanding College/University Teacher
- Outstanding Early Career in Post Secondary Education
- Outstanding Secondary School Science Teacher
- Distinguished Professional Scientist (non-academic)

Detailed criteria for each category are available online at www.kyscience.org/content/nominations.php. Nomination packets for all awards should include an abbreviated curriculum vitae (5 pages or less) containing information pertinent to the award as well as a list of publications, and letters of recommendation from two to three professional colleagues well acquainted with the candidate's qualifications for the award.

Outstanding Academy Service Award nomination packets should include documentation of special contribution to the Academy.

Outstanding Secondary School and *College/University Teacher* awards nomination packets should include documentation of special accomplishment as a teacher of science, especially measures of student success, participation in student development beyond the classroom, and science curriculum development. Letters of recommendation for secondary school teachers may also come from an administrator or supervisor, a teaching colleague, a student, or a parent.

April 15, 2014, is the deadline for nominations. All nominations and supporting materials should be sent in electronic format; e-mail attachments must be in MS Word format. Send to:

Dr. Eric Jerde
Morehead State University
Deparment of Earth & Space Sciences
e.jerde@moreheadstate.edu

Research Themes in Evolution V: Primate Dentition and Dietary Habit

The early Miocene epoch (~23 mya to 5.3 mya) contains a fossil record of diverse primates that proliferated in an adaptative radiation. Although many plants of the Miocene are extinct, the mechanical properties of those plants were likely identical to modern hominoid taxa. Consequently, it is likely that Miocene hominoid taxa would possess similar dental morphologies and dietary adaptations. In his research, Andrew Deane of the University of Kentucky investigates the dental morphology of Miocene fossil hominoids and extant primates to better understand their diets and the influence of diet in hominoid evolution. Previous studies that infer diet from incisor crown dimensions have grouped taxa into two broad dietary categories - folivorous (foliage and herbaceous vegetation) or frugivorous (fruits, seeds). Deane has expanded these dietary categories to show a greater refinement of dietary diversity in early hominoids similar to the levels of dietary diversity observed in extant apes. Using polynomial curve-fitting techniques that measure incisor curvature, as well as linear measurements, Deane was able to discriminate among the diets of closely-related taxa that rely on similar fallback resources consumed during periods of resource scarcity and stress.

Extant hominoid taxa from four genera, *Gorilla* (gorilla), *Pan* (chimpanzee), *Pongo* (orangutan), and *Hylobates* (gibbon) were grouped into one of four dietary classifications based on field studies of feeding habits. Dedicated folivores consume herbaceous vegetation (>75% total diet) with little supplementary fruit, diets softer than the diets of hard-object frugivores. Mixed folivore/frugivores consume greater amounts of fruit (30-60% total diet) than dedicated folivores to supplement herbaceous diets. Soft- and hard-object frugivores consume about the same proportion of fruits in their diets (>60%) but the texture and hardness, or resistance to crack propagation, of these fruits varies greatly. Mixed folivore/frugivores consume diets intermediate in toughness between those of dedicated folivores and soft-object frugivores.

Based on differences in incisor distances and crown curvature, Deane was able to distinguish frugivores (*Hylobates* sp, *Pongo pygmaeus, Pan troglodytes, Pan paniscus*) from all mixed folivore/frugivores (*Hylobates syndactylus, Gorilla gorilla gorilla, Gorilla gorilla graueri*) and the dedicated folivore (*Gorilla gorilla beringei*). Further discriminations could be made separating mixed folivore/frugivores and soft-object frugivores (*Pan trogdolytes, Pan paniscus, Hylobates* sp) from the dedicated folivore (*Gorilla g. beringei*) and hard-object frugivores (*Pongo pygmaeus*). All gorilla species and subspecies clustered together, but *Gorilla b. graueri* and *Gorilla g. gorilla* (mixed folivore/frugivores) had dental morphology placing them as intermediate between the dedicated folivore *Gorilla b. beringei* and the frugivorous cluster *Pongo pygmaeus, Pan troglodyte,* and *Hylobates* sp. Frugivorous diets were correlated with strongly curved incisors. The most pronounced incisor curvature was associated with hard-object frugivory, compared to the least-curved incisors in the dedicated folivore.

Incisor morphology is governed both by phylogeny and dietary function. *Pan troglodytes* and *Pan paniscus* are both soft-object frugivores, but the reduced incisor curvature of *Pan paniscus* indicated it as intermediate between other frugivores and folivores such as *Gorilla*. This reflects increased leaf consumption in the latter and is a strong indication that incisor curvature variation tracks dietary variation. Conversely, the results of the analysis specific to the maxillary lateral incisor demonstrates that extant hominoids group according to the phylogenetic distinction between taxa with spatulate lateral incisors (*Pan, Homo*) and hominoids with peg-shaped lateral incisors (*Pongo, Gorilla, Hylobates*). This distinction is unrelated to diet and demonstrates that although incisor morphology is primarily governed by diet and the mechanical properties of the foods consumed by hominoids, phylogeny can also influence incisor crown curvature.

The results of the analyses of early hominoid incisal curvature variation provide compelling evidence for the potential influence of van Valen (1973) "Red Queen Effect." The Red Queen hypothesis, an ecological rather than genetic model of adaptation, is based on the optimal use of resources in an ecological context, and the probability of diversification of a group within the adaptive zone. It predicts pressure on a group to evolve at least at a comparable rate to that of other sympatric groups in order to maintain life in the presence of competition. Simply put, an organism must continually adapt just to maintain the same level of adaptedness. Adaptation may be quicker or slower, depending on pressure to adapt from external forces such as environmental change or adaptation by other groups. Although early Miocene hominoids possess a similar range of dietary adaptations (i.e., more frugivorous to more folivorous), their incisal crown morphology is downshifted relative to extant hominoids. This means although pronounced incisal curvature is associated with increasing levels of frugivory, a frugivorous early Miocene ape will not have incisors as curved as an extant Miocene ape, although it is likely their reliance on fruiting resources was broadly similar.

Ecological habitat is a primary factor in classifying animals according to taxonomic groups. Deane has applied his morphometric approach to incisor shape to the morphology of early hominoid fossil taxa in an attempt to better understand the dietary variation within that group. His comparative dental morphology analysis of extant hominoid genera (*Gorilla, Pan, Pongo*, and *Hylobates*) was used as the basis for a comparative analysis of incisor shape and curvature in early Miocene large-bodied catarrhines, including the genera *Proconsul, Morotopithecus bishopi, Rangwapithecus gordoni,* and *Afropithecus turkanensis*. Apart from phylogenetic influences on dental morphology, analyses of incisor shape and curvature based on the function of these teeth in the diet allowed groupings of extant and fossil hominoids. Statistical analyses were able to correctly identify the diets of extant taxa and to identify morphological similarities between extant and fossil apes.

Deane's findings showed that early Miocene primate fossils were organized in three broad dietary groups: *Rangwapithecus*, similar to mixed folivore/frugivores like *Gorilla g. gorilla; Proconsul* and *Morotopithecus bishopi*, whose incisor morphology reflects a group consistent with general frugivory, similar to modern *Pan* and *Hylobates*; and *Afropithecus turkanensis*, whose strongly-curved incisors reflect hard-object frugivory, but combined with its distinct dental morphology, a dietary strategy more varied than that of seeds and nuts with hard coverings. Based on incisal length, breadth, and curvature, early Miocene taxa, except *Afropithecus turkanensis*, are most closely associated with extant mixed folivore/frugivore groups, separate from, but intermediate between, extant dedicated folivores and a cluster of hard- and soft-object frugivores. Only *Afropithecus turkanensis*, with greater incisor curvature, was most closely associated with extant frugivory.

Afropithecus turkanensis is a large hominoid known from the early Miocene (~23-17 mya) fossil record of east Africa. *Afropithecus turkanensis* has similar cranial features to the hominoid *Proconsul*, but also incisor features that identify it as a hard-object, sclerocarp forager, feeding on tough vegetation and hard-covered seeds similar to the diet of the extant pitheciins, *Chiropotes* and *Cacajao*. Canine tooth dimensions and crown shape are a marker of sclerocarp foraging habit. Deane analyzed canine linear dimensions and curvatures to determine the extent to which *Afropithecus turkanensis* and extant pitheciin canines are functionally convergent. A total of nine anthropoid genera, 3 hominoid (Pan, Gorilla, Pongo) and 6 ceboid (pitheciin *Chiropotes, Cacajao*, and non-pitheciin *Callicebus, Cebus*, *Lagothrix, Alouatta*), and fossil catarrhines *Proconsul* sp and *Afropithecus turkanensis* were included. Deane found that greater canine curvature and crown dimensions separated extant pitheciins (*Chiropotes, Cacajao*) and *Afropithecus turkanensis* from all other hominoids (P*an, Gorilla, Pongo)* and ceboids (*Callicebus, Cebus, Lagothrix, Alouatta*) and the fossil hominoid *Proconsul*. Although a small sample size, the canines of *Afropithecus turkanensis* showed similarities in bending strength and crown curvature to those of sclerocarp foragers *Chiropotes* and *Cacajao*.

Afropithecus is only distantly related to the extant pitheciins *Chiropotes* and *Cacajao*. Like those taxa, it had a hard-object diet, in which canine teeth may have been used to fracture hard seed- and fruit-coverings. *Afropithecus* canine morphology was influenced by diet, which is a rarity among anthropoid primates, where canines are more often used in agonistic social display. Dietary habit is reflected in a convergence of *Afropithecus* canine dental morphology with distantly related new-world pitheciins. The use of the canines in hard-object feeding, and a more general adaptation for lower quality hard-object resources, is consistent with interpretations of the hominoid fossil record suggesting that *Afropithecus* was the first hominoid to expand its range beyond continental Africa.

Further Reading

Dawkins, R. & Krebs, J.R. (1979). Arms races between and within species. Proceedings of the Royal Society of London, B, 205, 489-511.

Deane, A. (2009). First contact: Understanding the relationship between hominoid incisor curvature and diet. Journal of Human Evolution, 56, 263-274.

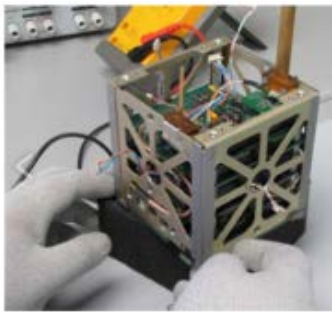
Deane, A. (2009). Early Miocene catarrhine dietary behavior: the influence of the Red Queen Effect on incisor shape and curvature. Journal of Human Evolution, 56, 275-285.

Deane, A. (2012). New evidence for canine dietary function in *Afropithecus turkanensis*. Journal of Human Evolution, 62, 707-719.

van Valen, L. (1973). A new evolutionary law. Evolutionary Theory, 1, 1-30.

Submitted by Mary Janssen, Ph.D.
Member-at-Large, Governing Board, KAS

Kentucky Space in the News



Eagle-1, a PocketQube class satellite that measures 5 centimeters-by 5-centimeters-by-15 centimeters (about the size of a quart of milk) and weighing 430 grams (about one pound), was launched on November 21 on a DNEPR-1 rocket from Dombarovsky Cosmodrome at Yasny, Russia.

The extremely small experimental satellite – possibly the smallest functional spacecraft ever placed in orbit – was deployed in orbit by a larger satellite Unisat-1 developed in a partnership between Kentucky Space, Morehead State University and the University of Rome La Sapienzia Aerospace Engineering School and a commercial spin-off called the Group of Astrodynamics for the Use of Space Systems, according to a news release.

This class of satellite, which was originally proposed by MSU Professor Robert Twiggs, further demonstrates the power and potential of new micro technologies in space. Eagle-1 was designed and built by Twiggs, Kentucky Space and MSU students along with the involvement of Dr. Garrett Jernigan and students at Sonoma State University in California.

Kentucky Space ground operations has confirmed that Eagle-1 is functioning normally with all systems performing as expected.

Submitted by John Mateja, PhD, Director,
McNair Scholars Program, Murray State University

NGSS Under Attack

SB 1 (BR 856) - J. Bowen, R. Stivers II, J. Higdon, J. Schickel, D. Thayer, M. Wilson

AN ACT proposing to create a new section of the Constitution of Kentucky relating to administrative regulations.

Create a new section of the Constitution of Kentucky to permit the General Assembly by general law to prohibit the adoption of administrative regulations that it has found to be deficient.

This bill that would undermine the Next Generation Science Standards was passed by the Kentucky Senate and sent to the House *Elections, Constitutional Amendments & Intergovernmental Affairs Committee* on February 11th. The members of this committee are:

Darryl T. Owens (D), Chair
Kevin D. Bratcher (R), Vice Chair
Joseph M. Fischer (R), Vice Chair
Mary Lou Marzian (D), Vice Chair

Visit http://www.lrc.ky.gov/record/14RS/SB1.htm to track the bill's progress. For legislators' contact info visit: http://www.lrc.ky.gov/whoswho/email.htm.

2014 Louisville Regional Science and Engineering Fair

Judges Needed for the 2014 Louisville Regional Science & Engineering Fair Saturday March 8, 2014!

This year we are celebrating our 50th Anniversary of the fair and we need your help more than ever. We are still in need of about 80 judges for this year's fair. If you've already signed up for this year's fair, we thank you for your participation and encourage you to invite your colleagues to judge as well. The Science Fair will be morning and afternoon at the University of Louisville's Swain Student Activities Center near Brook St. & Cardinal Blvd.

For more information on judging, please visit our judges' information page on our new site: http://lrsef.org/judges.

Kentucky Junior Academy of Science

The 2013 Annual Meeting of the Kentucky Junior Academy of Science will be held 8:30 am – 5 pm on Saturday, April 19, 2014, in the T. H. Morgan Building on the campus of the University of Kentucky, Lexington, KY. Any Kentucky high school or middle school student may present his or her research findings; to register for the meeting, a teacher, supervisor or principal from your school must return to the Director of KJAS, the requisite membership form and fee, abstracts and papers for all students entering from your school. All forms, abstracts, papers and checks from the school must be submitted to KJAS by March 21, 2014. Late submissions WILL NOT be accepted. Four overall winners are selected and these students represent Kentucky at the National American Junior Academies of Sciences (AmJAS) meeting held in February the following year. The Kentucky Academy of Science will provide needs-based funding for these students to attend this meeting, up to a limit of $1,000 per person. Needs-based funding will also be available for chaperones, up to a limit of $1,000/person. Checklist for presenting at the meeting:

- ☐ Paper Submission Form
- ☐ Membership Form and fee
- ☐ Abstract (hard copy only)
- ☐ 2 hard copies of word-processed Research Paper
- ☐ Signed copy of waiver

Additional information and parking directions will be mailed on receipt of above materials. All forms and instructions can be downloaded from the KAS webpage (click on KJAS link):

www.kyacademyofscience.org/members/jkas.html

Mail to: Dr. Ruth E. Beattie, Director, KJAS, Dept. of Biology, University of Kentucky, Lexington, KY 40506, rebeat1@uky.edu, 859-257-7647, by March 29, 2013.

Attention KAS Members Judges are needed for the KJAS Spring Symposium. Please contact rebeat1@email.uky.edu to volunteer. Thanks.

Posters at the Capitol 2014

Posters-at-the-Capitol 2013 will be held on Thursday, February 27th. Viewing the presentations at Posters-at-the-Capitol helps those in Kentucky who fund higher education understand why opportunities to engage in scholarly research and creative work are so important to our students' educational experience and professional development. The 2014 Program Booklet containing 129 abstracts summarizing their presentations is now available at the P@C website at http://campus.murraystate.edu/services/URSA/.

Kentucky Heritage Land Conservation Fund

Kentucky Heritage Land Conservation Fund: Benefits to the Kentucky Academy of Science

Dr. Richard K. Kessler (Chair) and Zeb Weese (KHLCF Biologist)

The Kentucky Heritage Land Conservation Fund (KHLCF) has benefitted numerous KAS affiliated colleges and universities, faculty and students. A number of schools have been awarded acquisition and management funds allowing them to both protect important natural areas and provide opportunities for college level research and education in the fields of conservation biology, ecology, and environmental science. Among these sites are the 1) Green River Biological Preserve and 2) Crump's Cave Research and Education Preserve of Western Kentucky University, 3) Lily Cornett Woods of Eastern Kentucky University, 4) Kentucky State University Environmental Education and Research Center , and 5) Clay Hill Memorial Forest of Campbellsville University. Each of these sites exhibit land stewardship and provide hands-on opportunities for faculty-led student engagement from biological inventories to detailed water quality analyses. In addition, some sites serve as laboratories for courses such as ecology, ornithology or ichthyology.

Click on the photos below to learn more about these sites.

KAS member institutions, faculty and students also benefit from other KHLCF projects even though they may not be institution owned because biological inventory or other research may either be required or requested (and often funded) by KHLCF. Some examples include: Amphibian and plant research by Drs. Richard Durtsche and Bill Bryant of Northern Kentucky University and Thomas More College at the Kenton County Conservation District's St. Anne's Woods and Wetlands project; Bat foraging research by University of Kentucky's Dr. Luke Dodd at Lower Howard's Creek Preserve in Clark County; Hydrological research of acid seep environments by Dr. Chris Barton at Mt. Victory Seeps Nature Preserve in Pulsaski County.

One of the four criteria of the KHLCF program is the purchase of "areas to be preserved in their natural state for public use, outdoor recreation and education." In addition to supporting (by statute) the Kentucky Environmental Education Council and the Kentucky Department for Energy Development and Independence education programs, project sites funded by KHLCF often support education on all levels from environmental education of pre-schoolers to PhD level scientific research. If you are interested in how KHLCF can benefit your KAS affiliated program or provide opportunities for research please visit the website at http://heritageland.ky.gov/Pages/default.aspx or contact Zeb Weese at 502-564-2320.

Don't forget to buy a nature license plate when you register your car, light truck or SUV!

Money from the sale of these plates goes into the Heritage Land Conservation Fund for purchasing natural areas to be left as wild places held in trust for future generations.