

Regional University Excellence Trust Fund
Programs of Distinction
Institution: Western Kentucky University
Program: Applied Research and Technology Program (ARTP)
Fiscal Year: 2005-2006
Due Date October 15

1. Program description, including:

A. The ARTP had 85 full-time and 17 part-time faculty members participate in the program, including 5 newly hired faculty.

B. The ARTP involved 102 faculty members in collaborative research and teaching.

C. The ARTP had 35 full-time and 35 part-time staff involved. This does not count the numerous scientists affiliated with the National Park Service at Mammoth Cave National Park, Electronic Warfare Associates, and the USDA/ARS and their staff who worked with our students on projects.

D. The ARTP engaged 340 undergraduate and 61 graduate students in applied research and technology projects this year.

E. The ARTP has worked through the Directors of Centers to foster interdisciplinary activities. Table 1 illustrates the most salient examples. What is not reflected in the table is the fact that faculty and students from various disciplines participate in many projects. The GIS laboratory and the Engineering Services Center have cut across many disciplines in the conduct of applied research projects. Three sub-centers within the Engineering Services Center have been consolidated. A new Center, the Bioinformatics and Information Sciences Center, was formed that will engage 47 faculty from four disciplines, mathematics, computer science, engineering and biology.

F. As of the close of the budget cycle, the balance was not absolutely accurate because some encumbered items had not hit the financial system. The apparent carry forward was \$256,534.96, however \$172,561.63 was encumbered for specific projects that follow: Kentucky Space Grant Consortium cost sharing commitment of \$2,798, patent application for \$1,872.89, out of country travel for a students for \$2,790.44, cost sharing for grants with the National Park Service, Kentucky EPSCoR, USAID in the amount of \$148,561.63, infrastructure improvements for \$47,270.28 and travel abroad to Africa for a student group research project for \$24,000. This leaves \$76,512 in actual carry forward with less than \$15,000 left in any one Center within the ARTP and some of this is committed for continuing graduate students.

2. Professional Activity and effort to establish a national reputation, including:

A. Number of grant proposals written, titles, and amount of funds obtained.

Faculty members in the ARTP submitted 147 research proposals for a total dollar amount of \$33,071,961. (See Appendix A) There were 223 grants awarded for a total of \$14,830,447. (See Appendix B)

B. Number of titles of conference papers and articles accepted for publication.
 Faculty members in the ARTP had 159 publications (See Appendix C).
 Faculty members and/or students in the ARTP attended 7 local, 12 regional, 90 national, and 12 international conferences. (See Appendix D). Faculty members and/or students in the ARTP presented papers at 45 local, 56 regional, and 53 national and conferences (See Appendix E).

Table 1. Multidisciplinary Projects/Activities										
Project Description										
	Agricultural Research and Education Complex	Applied Physics Institute	Biotechnology Center	Center for Biodiversity Studies	Center for Cave and Karst Studies	Center for Water Resource Studies	Engineering Services	Institute for Combustion Science and Environmental Technology	Kentucky Climate Center	Materials Characterization Center
USDA/ARS Animal Waste Management Project	X		X		X	X	X	X	X	
Chestnut Restoration Project with Mammoth Cave National Park	X			X						
Homeland Security Projects with Electronic Warfare Associates	X	X								X
Circulating Fluidized Bed Combustion Project (DOE, EKP, Cinergy)	X	X					X	X		X
Upper Green River Biological Preserve restoration project (NPS)	X			X					X	
Mammoth Cave International Science and Learning Center				X	X	X			X	
Greenhouse compost project	X						X			
Army Research Laboratory Testbed project		X					X			X
Robotic Microgravity-Resistivity Void Detector						X		X		

C. Conferences sponsored by the Program

The Centers of the ARTP sponsored the following conferences during 2005/2006. The Center for Biodiversity Studies and the Center for Cave and Karst Studies hosted the Mammoth Cave International Science and Learning Center Planning meeting, March 3-4, 2006. The Center for Water Resource Studies hosted the Kentucky GIS Conference in Bowling Green, August 23-24, 2005.

D. Program-sponsored applied research and prospects for commercialization.

Students and faculty were involved in a number of applied research projects (see appendix F). Intellectual property with the potential for commercialization has been generated through several of these projects. Identification of a plant extract effective against Herpes Simplex Virus in cell culture is being studied to identify the specific compound responsible for the dramatic effects on clearing the virus. The Center for Cave and Karst Studies together with Engineering Services Center has developed a robotic microgravity/resistivity device for the detection of subsurface voids. The commercial prototype for this device is currently being tested by the boarder patrol along the Mexico/USA border. As part of the USDA/ARS collaboration, the Agricultural Research and Education Complex is working on a cattle evaluation facility that can add as much as \$30 per head profit for cattle. Improved waste management strategies are being developed that will allow farmers to concentrate cattle in this manner yet handle the increased waste load in a cost effective manner. The Institute for Combustion Science and Environmental Technology continues to collaborate with companies associated with coal-fired power plants to reduce harmful emissions. This Center has developed several useful byproducts and improved processes for more efficient burning of coal and reducing emissions that may be marketable.

E. Collaborative engagement with other local, regional, and state agencies or institutions.

In order to build our capacity to engage more students in applied research and technology projects, the ARTP has networked with a number of agencies, locally, statewide, regionally, nationally and internationally. The following examples are the most salient in this regard but should not be construed as an exhaustive list.

The Applied Physics Institute collaborates with the Oak Ridge National Laboratory, Electronic Warfare Associates, Northwest Nuclear and NuSAFE. The Bioinformatics and Information Sciences Center and the Applied Physics Institute are collaborating with the University of Arizona and the Center for Computer Security Research at the University of Mississippi on a project with the Army Research Laboratory and Electronic Warfare Associates. The Institute for Combustion Science and Environmental Technology has worked with Power Companies in over 40 states. They continue to work with East Kentucky Power, Cinergy, Illinois Institute for Clean Coal, and a number of other institutes, 12 other universities and a number of companies across the nation such as Dow Corning in New Jersey. The Center for Water Resource Studies has established collaborations with the Division of Water, the Kentucky Rural Water Association, Bowling Green Municipal Utilities, EPA Region IV, the Kentucky Water Institute, and SDI,

corporation, in order to increase capacity of small drinking water systems to meet the needs of clients while adhering to EPA guidelines for water quality. The Biotechnology Center and the Agricultural Research and Educational Complex is working on a joint venture with the USDA/ARS Animal Waste Management Unit, the University of Kentucky USDA/ARS Forage Unit, local farmers, the Natural Resources Conservation Services, the UK extension service persons related to improving the profitability of beef cattle while exploring best management practices for handling the animal waste. The Agricultural Research and Educational Complex, the Center for Cave and Karst Studies, the Center for Water Resource Studies, and the Center for Biodiversity Studies have numerous agreements for studying natural resource management issues with the National Park Service at Mammoth Cave National Park. The Center for Water Resource Studies is working on an international collaboration with China through the USAID program to improve environmental conditions in karst areas polluted by arsenic and the Center for Biodiversity Studies and the Biotechnology Center are teaming up in partnership with the University of Nairobi, Kenya to help them use new technologies to reduce poaching of large game animals.

F. Formation of an external advisory board for the program and any reports the board generated.

The ARTP has had an active advisory board since its inception. The Report of a recent Advisory Board meeting is included as Appendix G.

G. Integration of program into high school-university cooperative arrangements.

Faculty members from many of the Centers engaged in activities to interest middle and high school students in science and engineering in addition to judging local and regional science fairs and helping students with science projects.

The Institute for Astrophysics and Space Science continue to use their network of robotically operated telescopes (one in Crimea now) to transmit real astronomical data to WKU and to high schools. Members of this center have mentored a group of students in astronomy at Warren Central High School.

The Engineering Services Center hosted a robotics and LEGO competition for high school and middle school students from around the region in the fall of 2005.

H. Distance learning and alternative course offerings.

The Institute for Astrophysics and Space Science offers data streaming capability for high schools and has shared data with several high school groups. In general, faculty members who are members of the centers are developing online courses and curricula, but these are not necessarily activities directly associated with the ARTP. New curricula are developing from activities of the ARTP as a result of areas of strength that have been developed, such as environmental science (MS), materials science, and homeland security (interdisciplinary MS).

I. Promotion of the program to the public.

New brochures designed by a creative student organization on campus have been produced. These brochures are being disseminated at every opportunity. Our

quarterly newsletters have been mailed to as many industries and collaborative partners of the ARTP as we have addresses. The ARTP is advertised on tractor trailers and vans associated with Centers. Our public relations person, hired through the USDA/ARS program has advertised the ARTP statewide. The ARTP has actively linked with the Bowling Green Chamber of Commerce, the Owensboro Chamber of Commerce and the Central Regional Innovation and Commercialization Center (CRICC) to help with economic development. These linkages have done much to improve our visibility. In addition, we are planning a large event for this coming spring in order to make more industries and potential collaborators aware of the ARTP. Our challenge of getting the word out has changed to the challenge of meeting the many opportunities for student engagement in applied research projects. This is a nice challenge to have to meet.

3. Student Activities, including:

A. Opportunity for students to participate in regional and national conferences and competitions.

Student participation in conferences and competitions was covered above (See Appendices D and E). Some of those not covered above are sponsored by the Engineering Services Center. This Center sponsors students in the Concrete Canoe (won the regional competition and in the top 10 nationally), Steel Bridge and Robotics competitions nationally.

B. Opportunity for students to participate in research.

This question has been addressed several times previously (See, Appendix F). There has been abundant opportunity for students to engage in applied research and internship projects through the ARTP. Because WKU is not striving to be a Research I Institution, but a nationally prominent Comprehensive University, strategies to build the capacity of faculty members to engage students needed to be developed and implemented. The strategy involves the formation of cooperative/collaborative partnerships with local and regional agencies and industries. In order to keep faculty in the classroom, yet provide them with the opportunity to excel in applied research, many postdoctoral persons, visiting scholars and technicians have been hired through grants or appropriations. These professional scientists provide the faculty with the extra hands to work with students 5 days per week, 7.5 hours per day. This strategy has been very successful for those faculty impacted. In addition, the ARTP has established internship programs with the USDA/ARS, the National Park Service at Mammoth Cave National Park and with companies in the Business Accelerator at the WKU Research and Development Center. These internships have led to at least 7 of our graduates gaining employment with these entities this past year alone. Everyone wins with these strategies, our students, our faculty, the community and the constituents involved. The students involved in such ARTP applied research projects have developed into young professionals who are fully prepared to enter the work force or graduate/professional schools.

C. Internship or service learning opportunities.

(See above and Appendix F)

D. Effort to recruit female and minority students and number of female and minority students out of total number in the program.

Although not directly associated with the ARTP, the college sponsors a Women in Science Group. This active group of women scientists hosts a “Girls in Science Day.” Over 100 middle and high school girls attend this day of hands-on science activities.

The ARTP director participated along with nine other institutions of higher education in Kentucky and West Virginia in submitting a Louis Stokes Alliance for Minority Participation. This grant aimed at involving more underrepresented persons in science, technology, engineering and mathematics (STEM) disciplines was recently awarded.

Of the 61 graduate students in the ARTP, 31 were male and 30 were female, 2 were African American, 15 were Asian, 4 were Indian, 2 were other and 1 was Hispanic.

Of the 340 undergraduate students, 178 were male and 162 were female with 3 African Americans, 4 Asians, 2 Indian, 3 Hispanic, 2 other and 7 undeterminable.

The ARTP offers stipends for students with financial need in order to allow them to become more involved in research projects instead of obtaining a job that detracts from their education.

Although we are aggressively recruiting females, the numbers do not indicate that we have a gender problem of engaging women in applied research projects. The literature indicates that women and minorities learn better by engaging in hands-on projects that have relevancy.

E. Scholarships and graduate assistantships available and filled.

Of the 61 graduate students, 7 were funded on departmental assistantships alone, 7 on ARTP alone, 5 were on departmental assistantship and ARTP, 1 by ARTP and grants/contracts, 7 by departmental assistantship, ARTP and grants/contracts, 12 by departmental assistantship and grants/contracts, 11 by grants/contracts alone and 11 received no funding. All graduate assistantships were filled. We could use many more.

Of the 340 undergraduate students, 32 were supported with ARTP funds alone, 102 were supported by grants/contracts, and 4 were supported with ARTP and grants/contracts funds. Twelve additional students received funds through matching for Ashland Oil Scholarships. All scholarships available were filled.

4. Measures of program success, including:

A. Measures of program’s economic impact.

The ARTP has really gained traction in the area of economic development in partnership with the CRICC, the Bowling Green Chamber of Commerce, the WKU Research and Development Center. This effort has grown to such an extent that WKU has recently hired an Associate Vice President for Research and Economic Development. The CRICC has developed a state-of-the-art business accelerator

currently occupied by 15 high tech start-up companies with more waiting to move in. Six of these companies are related to materials science and rely on the faculty and student expertise of the three co-located ARTP Centers, the Materials Characterization Center, the Institute for Combustion Science and Environmental Technology and the Applied Physics Institute. These companies are growing and hired six of the ARTP students who have graduated and had interned with them this past year. The three Centers adjacent to this accelerator involve 7 faculty members, 6 employees and have 39 students and research assistants working on applied research projects. Many of these research projects are in collaboration with the companies. Momentum is building in this cluster focused on materials science. The unexpected benefit of this cluster is that the companies have served as portals for additional opportunities for applied research not generally available for faculty, students and staff.

The Director recently submitted a \$599,911 NSF Partnership for Innovation grant application to recreate this model in Owensboro in another focus area in the statewide strategy for economic development, biotechnology. This is a partnership between the ARTP, WKU, the Greater Owensboro Economic Development Corporation, the Owensboro Community and Technical College, the WKU extended campus, the Owensboro Grain Company, Pedia Research and the Owensboro Medical Health System and others.

All totaled, the ARTP has been responsible for the creation of over 50 high-tech jobs in the area. The state's investment is working in this area.

B. Any changes planned to increase program effectiveness.

The ARTP will continue to focus its efforts and resources toward building interdisciplinary strengths in areas identified in the statewide economic development strategy including, materials science and energy, environmental science, biotechnology, human health and manufacturing. We have hired a very experienced senior scientist to lead the Materials Characterization Center. We have also hired an Associate Director of the ARTP to help oversee the expanded programs. Our efforts will continue to be aimed at enhancing interactions among the centers to build important clusters that are on the cutting edge and that will prepare our students for the work force of the future and make them highly competitive nationally and globally. These actions are consistent with Western's mission and the state's strategic plans.

C. Any changes planned in internal program success measures.

The measures of success for the ARTP seem to be appropriate and keep it focused on the goal of becoming nationally prominent. The ARTP is continuously evaluating itself and adjusting its course of action as opportunities change, but the assessment measures seem to meet the need for this process.

D. Evidence of achieving national prominence and fulfilling goals of HB1 for the Programs of Distinction.

There is no one sanctioning body or competition in the sciences that sanctions a national ranking. In that national prominence depends on recognition by peers for

excellence in programs measured through quality of our graduates, there are several indicators that our programs are achieving national prominence.

Between 1978 and 2002 Ogden College of Science and Engineering had the highest number of students in chemistry, second highest number in physics, and fourth highest in biology earning baccalaureate degrees who went on to earn doctoral degrees out of 21 colleges and universities in the Commonwealth (*J. Kentucky Acad. Sci.*, 2006). We feel the ARTP is increasing that number.

Engineering Services sponsored a concrete canoe team that won their 11th straight Ohio Valley Regional title in 2006 and finished in the top 10 teams in the nation for the 6th time in the past seven years.

The Institute for Combustion Science and Environmental Technology hosted the National Association of Thermogravimetric Analysis Scientists meeting and is recognized nationally and internationally as a top research center for coal emissions testing, analysis and solutions. A faculty member from Lehigh University will be joining this Center next spring.

The Biotechnology Center has received letters from laboratories in New Jersey and other areas requesting them to send them our graduates. They have been extremely satisfied with them in the past.

The Kentucky Climate Center has received an appropriation of \$1.5 M to establish a real-time weather-monitoring network (MESONET). They are forming a coalition throughout the state to implement this network that will have tremendous economic impact for the state in areas of forest management, drought prediction, hazard mitigation, fire hazard prediction, agricultural enhancement, etc. the faculty has been working closely with the National Oceanographic and Atmospheric Administration people on setting up this network as part of a national network. Kentucky will be the second state to have a fully developed network.

The Applied Physics Institute together with the Bioinformatics and Information Science Center is working with the Army Research Laboratory, Electronic Warfare Associates, the University of Arizona and the University of Mississippi on a anti-hacking project to secure the military's networks from attacks.

Perhaps more important to the Commonwealth, all centers of the ARTP work with industry and other agencies to develop high tech jobs for the region. This effort is a partnership between the Central Regional Innovation and Commercialization Center, the Chamber of Commerce, City and County Government, and the ARTP. Over 15 high tech companies are growing in the Business Accelerator at the WKU Research and Development Center. These companies hired 6 of our graduates this year and expansion is anticipated. Our materials sciences cluster is gaining traction and attracting intellectual capital to the Commonwealth. We appreciate the Commonwealth's investment in the ARTP, we have tried to be good stewards of the money and are hopeful for continued support.

Appendix C. Professional articles accepted for publication:

AMSI:

1. **Downing, N.** J.R. Downing Residence (Warren County KY).
 2. **Downing, N.** Natcher Residence (Bowling Green, KY).
 3. **Downing, N.** P & T Store, Thoroughbred SQ. (Bowling green, KY).
- Note: Built works requiring architectural license count as publications.*

API:

1. **Moore, R., J. Paschal and P. Womble.** (2005) "Cement Analysis using d+D Neutrons." Nuclear Instruments and Methods in Physics Research B 241, pp.765-769.

2. **Barzilov, A. and P. Womble.** (2006) "Comparison of Gamma-Ray Detectors for Neutron-Based Explosives Detection Systems." in Transactions of American Nuclear Society.
3. **Barzilov, A., J. Board, L. Hopper, J. Howard, R. Moore, T. Morgan, K. Moss, J. Paschal, B. Wallace and P. Womble.** (2006) "Inexpensive Robot Platforms for Detection and Neutralization Applications." Proceedings of the 7th International Symposium on Technology and the Mine Problem, Monterrey, CA.

AREC:

1. **Speer, N.** (2005-2006) *Monthly Market Profile*, July 05, August 05, September 05, October 05, November 05, December 05, January 06, February 06, March 06, April 06, May 06, June 06.
2. **Speer, N.** (2005-2006) "Beef Biz," *CALF News*, July 05, September 05, November 05, January 06, March 06, May 06.

BIOD:

4. **Bettez, N.D., A.E. Hershey, P.W. Lienesch, M. E. McDonald and W. J. O'Brien.** (2005) "Effects of a whole-lake, experimental fertilization on lake trout in a small oligotrophic arctic lake." *Hydrobiologia* 548: 51-66.
5. **Davis, A.L.V. and T. K. Philips.** (2005) "Effect of Deforestation on a Southwest Ghana Dung Beetle Assemblage (Coleoptera: Scarabaeidae) at the Periphery of Ankasa Conservation Area." *Environmental Entomology* (in press).
6. **Grubbs, S. A.** (2005) "*Perlesta shawnee* (Plecoptera: Perlidae), a new stonefly species from eastern North America." *Aquatic Insects* 27: 63-69.
7. **Grubbs, S. A.** (2005) "*Zealeuctra talladega*, a new species of stonefly from Alabama, U.S.A." (Plecoptera: Leuctridae). *Illiesia* 1: 40-42.
8. **Grubbs, S. A., B. T. Hutchins, J. M. Taylor and C. M. Thomas.** (2005) "Comparative life history study of two species of Nemouridae (Plecoptera) from an intermittent-perennial stream continuum from the central Kentucky karst region, U.S.A." *Verhandlungen Internationale Vereinigung für theoretische und angewandte Limnologie* 29: 912-916.
9. **Lienesch, P. W.** and M. Gophen. (2005) "Size-Selective predation by inland silversides on an exotic cladoceran, *Daphnia lumholtzi*." *The Southwestern Naturalist* 50: 158-165.
10. **Marcus, J. M.** (2005) "A Partial Solution to the C-Value Paradox." *Lecture Notes in Bioinformatics* 3678: 97-105.
11. **Marcus, J. M.** (2005) "Jumping Genes and AFLP Maps: Transforming Lepidopteran Color Pattern Genetics." *Evolution & Development* 7 (2): 108-114.
12. **Marcus, J. M.** (2005) "Point of View: Students, Butterflies, and Cancer." *Journal of College Science Teaching* 35 (3): 8-10.
13. **Ocampo, F.C. and T. K. Philips.** (2005) "Food relocation and nesting behavior of the Argentinian dung beetle genus *Eucranium* Brullé and comparison with the southwest African *Scarabaeus* (Pachysoma) (Coleoptera: Scarabaeidae: Scarabaeinae)." *Revista de la Sociedad Entomologica Argentina* 64: 53-59.
14. **Philips, T. K.** (2005) "*Acanthaptnus triplehorni*: A new genus and species of spider beetle (Coleoptera: Ptinidae) from Madagascar." *Annales Zoologici* (Warszawa) 55: 583-587.
15. **Philips, T. K.** (2005) "The spider beetles of Argentina." *Biodiversidad de Artópodos Argentinos* II.
16. **Smith, C.** (2005) "Of Heretics and Heroes" (review of "The Heretic in Darwin's Court," by Ross Slotten). *EMBO Reports* 6(3): 212.
17. **Smith, C.** (2005) "Alfred Russel Wallace (1823-1913)". In: *Biographical Encyclopedia of Astronomers* (Dordrecht, Netherlands: Kluwer Academic Publishers), Vol. 2.
18. **Smith, C.** (2005) "Alfred Russel Wallace, Past and Future". *Journal of Biogeography* 32(9): 1509-1515.

19. **Smith, C.** (2005) "Some Biogeographers, Evolutionists and Ecologists: Chrono-Biographical Sketches" (website)
<http://www.wku.edu/~smithch/chronob/homelist.htm>.
20. **Smith, C.** (2005) Review of "An Elusive Victorian" (Martin Fichman). *Archives of Natural History* 33(1): 179-180.
21. **Smith, C.** (2005) Review of "Inventing Global Ecology" (Lewis). *Choice* 42(5): 878.
22. **Smith, C.** (2005) Review of "The Heretic in Darwin's Court" (Slotten). *Journal of the History of Biology* 38: 169-172.
23. **Wainwright, P.C., Huskey, S.H., Turingan, R.G., Carroll, A.M.** (2005) "Ontogeny of suction feeding capacity in snook, *Centropomus undecimalis*." *Journal of Experimental Zoology* (in press).
24. **Chafee, D.L., S.A. Grubbs and D. Tarter.** (2006) "An updated checklist of the stoneflies (Plecoptera) of Kentucky." *Entomological News* 117: 1-10.
25. **Evans, T. M. and J. M. Marcus.** (2006) "A Simulation Study of the Genetic Regulatory Hierarchy for Butterfly Eyespot Focus Determination." *Evolution & Development* 8 (3): 273-283.
26. **Grubbs, S. A.** (2006) "*Allocapnia sano* (Plecoptera: Capniidae), a new stonefly species from Alabama, U.S.A." Plus six new state records. *Zootaxa* 1197: 39-43.
27. **Grubbs, S. A., B. T. Hutchins, J. M. Taylor and C. M. Thomas.** (2006) "Life cycles of *Leuctra* spp. and *Allocapnia recta* (Plecoptera: Leuctridae and Capniidae) across a flow gradient in a headwater karst valley." *Southeastern Naturalist* (in press).

BIOTECH:

1. **Austin, M.E., P.A. Cott, B.W. Hanna, A.O. MacGillivray, D.A. Mann, A.N. Popper and M.E. Smith.** (2005) "Effects of exposure to seismic airgun use on hearing of three fish species." *Journal of the Acoustical Society of America* 117(6):3958-3971.
2. **Bailey, J.C., S.E. Diamond, A.L. Ferry, J.S. Hodskins, D.M. Locasto, I.M. Mains, L.B. Meszaros, C.A. Rinehart, R.A. Sporici and A.M. Weidner.** (2005) "Repression of the prolactin promoter: a functional consequence of the heterodimerization between Pit-1 and Pit-1." *Journal of Molecular Endocrinology* 35, 317-331.
3. **Balaa, M.F., R. King and M.R. McLaughlin.** (2005) "Isolation of *Salmonella* Bacteriophages from Swine Effluent Lagoons." Accepted for publication, September 12, 2005 by the *Journal of Environmental Quality*.
4. **Belk, M.C., D.D. Houston, K.W. Johnson, M.E. Smith, and J.B. Wilson.** (2005) "Variation in intrinsic individual growth rate among populations of leatherside chub (*Snyderichthys copei* Jordan & Gilbert): adaptation to temperature or length of the growing season." *Ecology of Freshwater Fishes* 14(2):177-184.
5. **Bilotta, J., A. Moore, M.L. Risner and E.V. Vukmanic.** (2005) "Behavioral spectral sensitivity of the zebrafish (*Danio rerio*)." *Visual Neuroscience*. (in press).
6. **Bilotta, J., J.M. Fadool, A.C. Morris, E.H. Schroeter and R.O.L. Wong.** (2005) "Cone survival despite rod degeneration in XOPS-mCFP transgenic zebrafish." *Investigative Ophthalmology and Visual Science* 46(12):4762-71.
7. **Cowan, J.H., L.A. Fuiman, Jr., J.P. O'Neal and M.E. Smith.** (2005) "Behavior and recruitment success in fish larvae: variation with growth rate and the batch effect." *Canadian Journal of Fisheries and Aquatic Sciences* 62:1337-1349.
8. **Doerner, K.C. and B.P. Mason.** (2005) "3-Methylindole Production in *Clostridium skatologenes* ATCC 25775." KY- TN Branch meeting of the American Society for Microbiology held Sept. 30-Oct.1, 2005. Nashville Tech. College. Nashville, TN.
9. **Doerner, K.C. and B.P. Mason.** (2005) "Nutritional Stress Increases Intracellular Phosphate and Polyphosphate in Poultry Litter Microflora." [Accepted for publication 25 June 2005] (LAM 2005-0506.R1)

10. **Doerner, K.C., B.P. Mason and Y. Vadari.** (2005) "Characterization of Phosphate Hyper-Accumulating *Staphylococcus* sp. Isolated from Poultry Litter." *In* Abstracts of the 105th General Meeting of the American Society for Microbiology. American Society for Microbiology, Washington D.C.
11. **Halvorsen, M.B., M.C. Hastings, A.S. Kane, D.L. Miller, Popper, A.N., M.E. Smith, J. Song, P. Stein and L.E. Wysocki.** (2005) "Effects of surveillance towed array sensor system (SURTASS) low frequency active sonar on fish." *Journal of the Acoustical Society of America* 117(4):2440.
12. **Marcus, J. M.** (2005) "A Partial Solution to the C-Value Paradox." *Lecture Notes in Bioinformatics* 3678, 97-105.
13. **Marcus, J. M.** (2005) "Point of View: Students, Butterflies, and Cancer." *Journal of College Science Teaching* 35(3), 8-10.
14. **Alva, A.L., S. Paramasivam, S.V. Sahi* and K.S. Sajwan.** (2006) "Fly Ash-Organic Byproducts Mixture as Soil Amendment." *J. Earth and Environ. Sci.* (in press).
15. **Archila, S.*, G.M. Carlson, M.A. King* and N.A. Rice.** (2006) "The cytoskeletal organizing protein Cdc42-interacting protein 4 associates with phosphorylase kinase in skeletal muscle." *Biochem. Biophys. Res. Comm.* Jul 14;345(4):1592-9.
16. **Bilotta, J., E.C. Davis, S.H. Haggbloom and M.L. Risner.** (2006) "Assessing appetitive choice discrimination learning in zebrafish." *Zebrafish.* (in press).
17. **Cano-Aguilera, I., G. Cruz-Jimenez, M. Duarte-Gardea, J.L. Gardea-Torresdey, A. Martinez, J.R. Peralta-Videa, G. Rosa, S.V. Sahi* and N.C. Sharma.** (2006) "EDTA effect on lead uptake and translocation by Tumbleweed (*Salsola kali*): agar and hydroponics Studies." *Environ. Toxicol. Chem.* (under review).
18. **Datta, R., M. Israr, S.V. Sahi* and D. Sarkar,.** (2006) "Bioaccumulation and physiological effects of mercury in *Sesbania drummondii*." *Chemosphere.* (in press).
19. **Elliott, N.E. and Rice, N.A.** (2006) "Isolation of the promoter region of the PHKG1 gene." *FASEB J.* 20 (5):A957.
20. **Evans, T. M. and J. M. Marcus.** (2006) "A Simulation Study of the Genetic Regulatory Hierarchy for Butterfly Eyespot Focus Determination." *Evolution & Development* 8 (3): 273-283.
21. **Hancock, J.M. and Rice, N.A.** (2006) "Characterization of the Human PHKG2 Promoter." *FASEB J.* 20 (5):A957.
22. **Israr, M. and S.V. Sahi*.** (2006) "Antioxidative responses to mercury in the cell cultures of *Sesbania drummondii*. Plant Physiol." *Biochem.* (under review).
23. **Israr, M., J.C. Jain and S.V. Sahi.** (2006) "Cadmium accumulation and antioxidative responses in *Sesbania drummondii* callus." *Achives of Environ. Contamin. and Toxicol.* 50(1), 121-127.
24. **Jain, A, K.G. Raghothama and S.V. Sahi*.** (2006) "Molecular Mechanisms of Phosphate Deficiency Responses." *Plant Breeding Reviews.* (in press).
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14. **Choi, D.A. and Y.-S. Shon.** (2006) "Route to Redox-Active Nanoparticle-Cored Dendrimers: Post-Encapsulation of Ferrocene." *Chem. Lett.*, 6, 644-645.
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16. **Conte, E.D., C.-T. Hsu, H.-J. Lyuu, T.-H. Yang and J.-M. Zen.** (2006) "Profiling Clinically Important Metabolites in Human Urine by an Electrochemical System Containing Disposable Electrodes." *Sensors and Actuators, B: Chemical*, B113(1), 22-28.
17. **Hwang, S., S.H. Kim, D.F. Ogletree, M. Salmeron and Y.-S. Shon.** (2006) "Electronic Interactions Between Gold Nanoclusters in Constrained Geometries." *Phys. Rev. B* 73, 155406.
18. **Ko, W.-B., S.-W. Jo, Y.-S. Shon and J.-M. Yun.** (2006) "Ultrasonic Chemical Stability and Preparation of Self-Assembled Fullerene[C60]-Gold Nanoparticle Films." *Ultrasonics*. (in press).

Appendix D. Conferences attended by faculty and/or students.

AMSI:

1. **Reaka, B.** Global Village, Habitat for Humanity (Sofia, Bulgaria). July 1-2, 2005.
2. **Reaka, B.** Engaging the Spirit.

API:

3. Homeland Security Conference, Atlanta GA.
4. DARPA Symposium on Explosive Detection, Washington, D.C.
5. (2006) Meeting at NucSafe (DTRA Project), Oak Ridge, TN, February 3, 2006.
6. (2006) Meeting at University of Michigan (Ion Beam Lab), Ann-Arbor, MI, March 5-6, 2006.
7. (2006) WKU API and ISR Joint Meeting, Institute for Scientific Research, Fairmont, WV, March 23-24, 2006.
8. (2006) American Nuclear Society Radiation Protection Conference, Carlsbad, NM, April 3-7, 2006.
9. (2006) 36th Annual WKU Student Research Conference, Bowling Green, KY, April 8, 2006.
10. (2006) MINWARA Symposium, Naval Postgraduate School, Monterey, CA, May 1-5, 2006.
11. (2006) Meeting at the TVA Power Plant, Cumberland City, TN, May 10, 2006.
12. (2006) Meeting at Indiana University (LENS Project), Bloomington, IN, May 14-15, 2006.
13. (2006) American Nuclear Society Annual Meeting, Reno, NV, June 3-9, 2006.

AREC:

1. **Speer, N.** (2006) USDA Outlook Forum, February, Washington DC
2. **Speer, N.** NIAA Business Continuity Conference, Louisville, KY

BIOD:

1. (2005) 3rd RECOMB Comparative Genomics Satellite Workshop, Dublin, Ireland. (September 2005)

2. (2005) Society of Kentucky Lepidopterists Annual Meeting, Lexington, KY. (November 2005)
3. (2005) Kentucky Academy of Science 91st Annual Meeting, Richmond, KY. (November, 2005)
4. (2005) Phylogenetics Symposium and Workshop, Ohio State University. (December 2005)
5. (2005) 9th International *Rubus* and *Ribes* Symposium, Pucon, Chile. (December 2005)
6. (2006) Association of Southeastern Biologists/Southern Appalachian Botanical Society, Gatlinburg, TN. (March 2006)
7. (2006) Joint meeting of the Tennessee and Kentucky Chapters of the American Fisheries Society, Land Between-the-Lakes, TN. (March 2006)
8. (2006) American Society of Mammalogists, University of Massachusetts, Amherst, MA. (June 2006)

BIOTECH:

1. **Doerner, K.C.** General Meeting of the American Society for Microbiology. American Society for Microbiology, Washington D.C.
2. **Marcus, J.** (2005) 3rd RECOMB Comparative Genomics Satellite Workshop, Dublin, Ireland, September 2005 "A partial solution to the C-value paradox."
3. **Johnson, H.** (2005) IUPUI Assessment Conference 2005.
4. **Davis, C.** (2005) Annual Meeting of the American Society of Parasitologists. Mobile, Alabama, July 8-11, 2005.
5. **Davis, C.** (2005) ADVANCE Leadership Workshop for Department Heads and Emerging Leaders. Seattle, Washington. July 27-30, 2005.
6. **Jacobshagen, S.** (2005) "Differential Circadian Regulation of Various Genes is Theoretically Possible with One Mechanism." Eighth International Phycological Congress 2005, Durban, South Africa. August 13-19, 2005.
7. **Rodney K.** (2005) "RNA-Mediated Transcription Antitermination." Kentucky-Tennessee Branch meeting of the American Society for Microbiology held Sept. 30-Oct. 1, 2005, Nashville, TN.
8. **Davis, C.** (2005) Fancy Gap Immunoparasitology Workshop (Invited Speaker). Fancy Gap, Virginia. October 13-16, 2005.
9. **Jacobshagen, S.** (2005) "Differential Circadian Regulation of Various Photosynthesis Genes is Theoretically Possible with One Mechanism." 31st Midwest Photosynthesis Meeting, Turkey Run State Park, Indiana. October 28-30, 2005.
10. **Alice, L.A., C. Lennox and B.L. Sutherland.** (2005) "Taxonomic status and phylogenetic affinity of an invasive blackberry in South Africa." Kentucky Academy of Science annual meeting, Richmond, KY.
11. **Alice, L.A.** (2005) "Diversity and relationships of Bhutanese *Rubus* (Rosaceae)." 9th International *Rubus* and *Ribes* Symposium, Pucon, Chile.
12. **Ayers, R., H. Johnson, K. McDaniel* and W. Weidemann.** (2005) Teacher Education Model Program (TEMP): A Standards-Based Master's Degree Program in Elementary Education. Kentucky Academy of Science Annual Meeting. November 10-12, 2005.
13. **Coffin, A.B., D.L. Miller, A.N. Popper, M.E. Smith.** (2005) "Hearing and hair cell loss and recovery in noise-exposed goldfish." Physiology and Biochemistry Section, Kentucky Academy of Science, Richmond, KY. November 10-12, 2005.
14. **Davis, C.** (2005) Annual Meeting of the Kentucky Academy of Sciences (presented one paper, co-authored 2 additional papers. Eastern Kentucky University, Richmond, KY. November 10-12, 2005.
15. **Davis, C., H. Johnson*, N. Rice and R. Wyatt.** (2005) "Data-Driven Instruction: Correlation Between a Biology Attitude Survey and Content Pre-Assessment in an Introductory Course for Majors." Kentucky Academy of Science Annual Meeting, Richmond, KY. November 10-12, 2005.

16. **Johnson*, H. and K. McDaniel.** (2005) Partnering Homeschool Science Students with University Resources. Kentucky Academy of Science Annual Meeting. November 10-12, 2005.
17. **Johnson*, H. and R. Wyatt.** (2005) "A Solution to SACS-Mandated Assessment." Kentucky Academy of Science Annual Meeting, 2005. November 10-12, 2005.
18. **Marcus, J.** (2005) "Molecular phylogenetics and the evolution of mimicry in viceroys (*Basilarchia (Limenitis) archippus archippus*) and related butterflies." Society of Kentucky Lepidopterists Annual Meeting, Lexington, Kentucky, November 10-12, 2005.
19. **Marcus, J.** (2005) "Molecular phylogenetics and the evolution of mimicry in viceroys (*Basilarchia (Limenitis) archippus archippus*) and related butterflies." Kentucky Academy of Science 91st Annual Meeting, Richmond, Kentucky, November 10-12, 2005.
20. **Rice, N.A and N.S. Rowland.** (2005) 'Nitric Oxide Suppresses Pulmonary Myofibroblast Proliferation and Actin Expression." Kentucky Academy of Science annual meeting, Richmond, KY. [talk] November 10-12, 2005.
21. **Rinehart, C.** (2005) Kentucky Academy of Science, Richmond, Kentucky, November 10-12, 2005.
22. **King, R.** (2005) "RNA-Mediated Transcription Antitermination." Kentucky Academy of Science. Richmond, KY. November 10-12, 2005.
23. **Sahi, S.V. and A. Srivastava*.** (2005) "Screening of Genes Expressed in Response to Lead in *Sesbania drummondii*." Kentucky Academy of Science, Richmond, KY. November 10-12, 2005.
24. **Halvorsen, M.B., A.S. Kane, D.L. Miller, A.N. Popper, M.E. Smith, J. Song and L.E. Wysocki.** (2005) "Effects of low frequency sonar on fish." Association for Research in Otolaryngology 2005 Midwinter Research Meeting, New Orleans, Louisiana.
25. **Humphries, J., N. K. Lujan and M.E. Smith.** (2005) "Acoustic function of the encapsulated swimbladder of loricariid catfishes." American Society of Ichthyologists and Herpetologists 2005 Meeting. Tampa, Florida.
26. **Halvorsen, M.B., M.C. Hastings, L.E., Kane, D.L. Miller, A.N. Popper, M.E. Smith, J. Song, P. Stein, A.S. Wysocki.** (2005) "Effects of surveillance towed array sensor system (SURTASS) low frequency active sonar on fish." 149th Acoustical Society of American Meeting. Vancouver, Canada.
27. **Sahi, S.V.** (2005) "Higher Education and Biotechnology for Human Nutrition and Health." University of Agricultural Sciences, Bangalore, India.
28. **Sahi, S. V. and N. Sharma.** (2005) "Evaluation of organic phosphorus assimilation in *Lolium multiflorum*." Annual meeting of American Society of Agronomy, Salt Lake City, UT, November 2005.
29. **Sahi, S.V., N. Sharma and D. Starnes*.** (2006) "Use of *D. festulolium* in the remediation of phosphorus-enriched soils." American Society of Agronomy (south branch), Orlando, FL, Feb 2006.
30. **Israr, M., R. Quintero* and S.V. Sahi.** (2006) "Effect of plant growth hormones and EDTA on lead uptake in *Sesbania drummondii*." American Society of Agronomy (south branch), Orlando, FL, Feb 2006.
31. **Israr, M., S.V. Sahi and A. Srivastava*.** (2006) "Growth and copper accumulation in *Sesbania drummondii* exposed to high concentrations of copper." American Society of Agronomy, Orlando, FL, Feb 2006.
32. **Johnson, H.** (2006) Assessment Conference featuring Peggy Maki, Western Kentucky University, March 16, 2006.
33. **Johnson, H.** (2006) U.S. Department of Education Regional Math-Science Teams Meeting, Boston, MA. March 30-31, 2006.
34. **Alice, L.A.** (2006) Association of Southeastern Biologists/Southern Appalachian Botanical Society (March 2006)

35. **Davis, C.D.** (2006) Joint meeting of the Association of Southeastern Biologists / Southeastern Society of Parasitologists / TriBeta District Convention. March 29-March 31, 2006.
36. **Coffin, A.B., D.L. Miller, A.N. Popper and M.E. Smith.** (2006) "Anatomical and functional recovery of the goldfish saccule following noise exposure." Association for Research in Otolaryngology 2006 Midwinter Research Meeting, Baltimore, Maryland.
37. **Barnett-Johnson, R., A.B. Coffin, R. Josephson, D.L. Miller, D. Oxman, A.N. Popper and M.E. Smith.** (2006) "Otolith crystal type affects hearing sensitivity in Chinook salmon." Association for Research in Otolaryngology 2006 Midwinter Research Meeting, Baltimore, Maryland.
38. **Bebak-Williams, J., J. Davidson, W. Ellison, A. Frankel, F. Ford, A.N. Popper, M.E. Smith and L.E. Wysocki.** (2006) "Effects of environmental noise on hearing capabilities of fish." Association for Research in Otolaryngology 2006 Midwinter Research Meeting, Baltimore, Maryland.
39. **Cooper, N.G.F., C.D. Davis, A. Khalyfa, R. Shryock, and Y. Zhou.** (2006) "Microarray analysis reveals intense inflammatory response in the brains of antioxidant-supplemented mice infected with *Toxoplasma gondii*." UT-ORNL-KBRIN Bioinformatics Summit, Lake Barkley State Resort Park, Cadiz, KY. April 21-23, 2006.
40. **Rice, N. and C.A. Rinehart.** (2006) UT-ORNL-KBRIN Bioinformatics Summit, Lake Barkley State Resort Park, Cadiz, KY. (Poster) April 21-23, 2006.
41. **Bilotta, J. and B.D. Perkins.** (2006) "Mutation of the Zebrafish choroideremia Gene (Rab Escort Protein 1) Causes Photoreceptor Degeneration and Loss of Visual Function." Association for Research in Vision and Ophthalmology, Ft. Lauderdale, FL. April 30, 2006-May 4, 2006.
42. **Chandler, T., S. Jacobshagen and B. Kessler.** (2006) "Construction of a New *Chlamydomonas* Phototaxis Machine to Investigate Cryptochrome involvement in Circadian Entrainment." 12th International Conference on the Cell and Molecular Biology of *Chlamydomonas*, Portland, Oregon. May 9-14, 2006.
43. **Abo1, M.M., J., Bilotta, P.J. DeMarco, Jr. and T.S. Thornberry, Jr.** (2006) "ERG Responses of the Adult Zebrafish to Positive and Negative Flashes." Association for Research in Vision and Ophthalmology, Ft. Lauderdale, FL. May 9-14, 2006.
44. **Macus, J.M.** (2006) "Population structure of the genus *Junonia* in Florida." 57th Annual Meeting of the Lepidopterists' Society, Gainesville, Florida, June 2006.
45. **Powell, K.** (2006) Society for Behavioral Neuroendocrinology, Pittsburgh, Pennsylvania. June 17-20, 2006.
46. **Popper, A.N., M.E. Smith and L.E. Wysocki.** (2006) "Effects of background sound on fish." 151st Meeting: Acoustical Society of America, Providence, Rhode Island.
47. **Austin, M., P. Cott, B. Hanna, A. MacGillivray, D.A. Mann, A.N. Popper and M.E. Smith.** (2006) "Effects of riverine seismic air-gun exposure on fish hearing." 151st Meeting: Acoustical Society of America, Providence, Rhode Island.
48. **Rice, N.A. and N.S. Rowland.** (2006) "Nitric Oxide Suppresses Pulmonary Myofibroblast Proliferation and Actin Expression." American Society of Biochemistry and Molecular Biology annual meeting, San Francisco, CA. [poster].

CCKS:

1. **Crawford, N.C.*** (2005) "An Overview Of Karst Development Along The Cumberland Plateau Escarpment Of Tennessee, Alabama And Georgia." *National Speleological Society Annual Meeting*, July 2-6, 2005, Huntsville, Alabama.
2. **Crawford, N.C*.** (2005) "Application of Dye Tracer Techniques in the Preparation of a Conceptual Hydrogeologic Model for a Contaminated Karst Aquifer: SAAD Superfund Site, Nashville, Tennessee." *14th Annual International Congress of Speleology*, August 20-28, 2005 Athens, Greece.

3. **Adair, C., J. Brewer, M. Coffelt, N.C. Crawford, L.A. Croft*, R. Elrod, M. Firkins, B. Ham, J. Howard, C. Martin, P. Kambesis, R. Moore, C. Ray, J. Tallent, R. Taylor, A. Williams and A. Zimmerman.** (2005) "Development of Innovative karst Hydrogeologic Research Techniques for Solving Karst Environmental Problems." *14th Annual International Congress of Speleology*, August 20-28, 2005 Athens, Greece.
4. **Croft, L.A.*, M DePoy and R. Toomey*.** (2005) "Development of Innovative Karst Hydrogeologic Research Techniques for Solving Karst Environmental Problems" and co-presenting a poster "Karst Field Studies, Offered by Western Kentucky University's Center for Cave and Karst Studies, and the Mammoth Cave National Park International Center for Science and Learning." *14th Annual International Congress of Speleology*, August 20-28, 2005 Athens, Greece.
5. **Crawford, N.C.*** (2005) "Ground-Water Basin Catchment Delineation by Dye Tracing, Water Table Mapping, Cave Mapping, and Geophysical Techniques: Bowling Green, Kentucky." The 10th International Sinkhole and Hydrogeologic Problems of Karst Terrain Conference September 24-28, 2005, San Antonio, Texas.
6. **Crawford, N.C.*, D.B. Poiroux and J.H. Sanders.** (2005) "Hydrogeologic Investigation of Leakage through Sinkholes in the Bed of Lake Seminole to Springs Located Downstream from Jim Woodruff Dam." The 10th International Sinkhole and Hydrogeologic Problems of Karst Terrain Conference, September 24-28, 2005, San Antonio, Texas.
7. **Crawford, N.C.*** (2005) "The Flux of Water and Both Non-point Source and Point Source Contaminants During Storm Events in Free-Flow Karst Aquifers." *Geological Society of America Annual Meeting*, Salt Lake City, Utah, October 16-19, 2005.
8. **Crawford, N.C.** (2005) *Southern Regional and Kentucky State Round Table: Southeast Watershed Forum*, November 2-4, 2005.
9. **Crawford, N.C.** (2005) "The Flux of Water and Contaminants During Storm Events in Karst Aquifers". *Kentucky Academy of Science Annual Meeting*, Eastern Kentucky University, Richmond, Kentucky, November 10-12, 2005.
10. **Cesin, G., N.C. Crawford*, L.A. Croft and S. Wilson.** (2006) "Microgravity and Electrical Resistivity Techniques for Detection of Bedrock Caves, Voids In Unconsolidated Material and Clandestine Tunnels." *Real-Time Detection of Clandestine Shallow Tunnels Workshop*, Oxford, Mississippi, February 13-15, 2006. (Invited Paper).
11. **Crawford, N.C.*** (2006) "Storm Water Management Issues Related to Urban Areas Built Upon Karst." *Current Issues in Storm Water Regulation, Lorman Workshops*, Bowling Green, Kentucky, March 1, 2006. (Invited Paper).
12. **Crawford, N.C.** (2006) *Mammoth Cave International Center for Science and Learning Planning Meeting*, March 3-4, 2006.
13. **Crawford, N.C.*** (2006) "Dye Tracer Tests in Karst Aquifers." *USEPA Region 3, Lust Conference*, Roanoke, Virginia, April 3-5, 2006. (Invited Paper).
14. **Crawford, N.C.*** (2006) "Dye Tracer Tests and Geophysical Techniques in Karst Aquifers." *USEPA Region 3, Lust Conference*, Roanoke, Virginia, April 3-5, 2006. (Invited Paper).
15. **Crawford, N.C.*** (2006) "Dye Tracer Tests and Geophysical Techniques in Karst Aquifers." *USEPA Region 3, Lust Conference*, Roanoke, Virginia, April 3-5, 2006. (Poster Paper).
16. **Crawford, N.C.** (2006) *National Cave and Karst Research Institute Board of Directors Meeting*. Carlsbad, New Mexico, May 14-16, 2006.
17. **Cesin, G., N.C. Crawford*, L.A. Croft and S. Wilson.** (2006) "Microgravity and Electrical Resistivity Techniques For Detection of Caves and Clandestine Tunnels." *Joint Assembly, American Geophysical Union Meeting*, Baltimore, MD, May 23-26, 2006. (Invited Paper).

CWRS:

1. **Ernest, A.** (2005) The American Society of Civil Engineers/Environmental Water & Resources Institute at Williamsburg, VA, July 19-22, 2005.
2. **Ernest, A.** (2005) The National Environmental Service Center Conference relating to drinking water/wastewater and environmental issues for the Environmental Training Institute for Small Communities in Morgantown, WV. June 25, 2005. (Panel Discussion)
3. **Andrew, K. and J. Fattic.** (2005) The annual conference of the International Society of Environmental Information Sciences in Xiamen, China, July 26-28, 2005.
4. **Fattic, J.** (2005) The Kentucky Rural Water Association in Lexington, KY, August 22-24, 2005.
5. **Andrew, K.** (2005) The Kentucky GIS Conference in Bowling Green, KY, August 23-24, 2005.
6. **Ernest, A. and J. Fattic.** (2005) The Capacity Development Workshop at Region 4 EPA in Atlanta, GA, August 30 – Sept. 1, 2005.
7. **Fattic, J.** (2005) The 2005 Water Professional Conference in Covington, KY, September 12-14, 2005.
8. **Ernest, A.** (2005) The Ohio River Valley Water Sanitation Commissions workshop on Combined Sewer Overflow for Small Communities in Fort Mitchell, KY, September 13.
9. **Ernest, A.** (2005) The ASCE-KY annual meeting in Lexington, October 7.
10. **Wallace, M.** (2005) Hosted a booth at the National Rural Water Association's annual conference on Oct. 9-12, Sacramento, CA.
11. **Andrew, K. and S. Payton.** (2005) The 2005 Annual Meeting of the American Institute of Professional Geologists where Stuart Payton won the poster contest in Lexington, KY on Oct. 9-12, 2005.
12. **Fattic, J. and S. Kenworthy.** (2005) The Association of State Drinking Water Administrators' annual conference in St. Louis, MO on Oct. 18-20. Dr. Kenworthy was a presenter.
13. **Ernest, A.** (2005) The International Conference on Safe Water in San Diego, CA on October 20.
14. **Andrew, K., A. Ernest and J. Fattic.** (2005) Hosted a booth at the Southeast Watershed Roundtable in Bowling Green on Nov. 3-4.
15. **Ernest, A.** (2005) The Governor's Conference on the Environment in Louisville on Nov. 4.
16. **Tadakaluru, Aditya.** (2005) The joint International Conference on Computational Intelligence for Modeling, Control and Automation (CIMCA 2005) and the International Conference on Intelligent Agents, Web Technologies and Internet Commerce (IAWTIC 2005) in Vienna, Austria on Nov 28-30, 2005.
17. **Andrew, K. and A. Storey.** (2006) The KRWA Management Conference in Bowling Green, KY on February 13-15, 2006.
18. **Storey, A.** (2006) The KY Water Resources Research Institute (KWRRI) annual conference in Lexington, KY on March 2, 2006.
19. **Andrew, K., J. Fattic, R. Fowler, G. Grover and A. Storey.** (2006) The KY Water and Wastewater Operator's Association (KWWOA) annual meeting in Owensboro, KY on March 20-22, 2006.
20. **Andrew, K.** (2006) AWRA GIS Specialty conference in Houston, TX and gave two presentations May 8-10, 2006.
21. **CWRS.** (2006) Hosted guest speaker Alena Bartosova from Illinois State Water Survey who presented GIS information entitled "Modeling the Fox River Watershed" on May 12, 2006.
22. **Storey, A.** (2006) The annual KRWA Operator Expo in Bardstown and gave a presentation, May 24 -25, 2006
23. **Andrew, K.** (2006) AWWA in San Antonio, TX and assisted with the TACNet Booth, June 11-15, 2006

ESC:

1. **Lenoir, J. and K. Schmaltz.** (2005) ASEE/AaaE Global Colloquium on Engineering Education, Sydney, Australia. September 26 – 29, 2005.
2. **Choate, R. and D. Schmucker.** (2005) ASEE/IEEE Frontiers in Education Conference, Indianapolis, IN. October 21 – 23, 2005.
3. **Palmquist, S.** (2005) "Legal Issues for Kentucky Professional Engineers" Workshop Louisville, KY. October 21, 2005.
4. **Schmaltz, K.** (2005) Assessment Institute in Indianapolis. October 23, 24, 2005.
5. **Schmaltz, K.** (2005) ASME International Mechanical Engineering Conference and Exposition. November 7 - 10, 2005.
6. **Cambron, M.** (2006) Thirty-Eight Southeaster Symposium on System Theory in cooperation with IEEE Control Systems Society, Cookeville, TN. March 5-7, 2006.
7. **Cambron, M.** (2006) Southeast Regional IEEE Conference, Memphis, TN. March 31-April 2, 2006.
8. **Dettman, M.** (2006) CIEC Conference, San Antonio TX. Jan 31 - Feb 3, 2006.
9. **Wilson, S.** (2006) International Society for Optical Engineering Defense and Security Symposium, Orlando, FL. April 2006.
10. **Choate, R, J. Lenoir and K. Schmaltz.** (2006) "An Integrated Hands-on Freshman Experience", ASEE Conference and Exposition, Chicago, IL. June 18, 2006. (*invited to provide a workshop*)

HERI:

1. **Croskrey, A., C. Groves*, M. Hendrickson, P. Kambesis and B. Tobin. (Co-authors) C. Bolster and J. Meiman.** "Quantitative Evaluation of Data Quality in Electronic Data Logging of Karst Flow Systems". The National meeting of the National Speleological Society, Huntsville Alabama.
2. **Croskrey, A., C. Groves, W. Hawkins, P. Kambesis, J. Kovarik and B. Tobin.** (2005) The International Congress of Speleology, Athens, Greece.
3. **Groves, C., (Co-authors) C. Bolster and J. Meiman.** "Spatial and Temporal Variations in Epikarst Storage and Flow in South Central Kentucky's Pennyroyal Plateau Sinkhole Plain." The US Geological Survey Karst Interest Group Conference Rapid City, South Dakota.
4. **Groves, C., (co-author) S. Dobler.** "Environmental Issues in Limestone Karst Regions." The US Department of Defense Force Protection Conference Louisville, Kentucky. (*Invited talk*).
5. **Hendrickson, M., P. Kambesis and J. Kovarik.** The National Cave and Karst Management Symposium, Albany, New York.
6. **Groves, C.** (2005) The 2005 Southeast Regional and Kentucky State Watershed Roundtable, Lexington, Kentucky.
7. **Despain, J., C. Groves and P. Kambesis.** The annual meeting of the Cave Research Foundation, Cape Girardeau, Missouri
8. **Despain, J., C. Groves and P. Kambesis.** The annual Cave Research Foundation Board of Directors meeting, Cape Girardeau, Missouri.
9. **Groves, C.** The annual Scientific Board Meeting of the UNESCO International Geoscience Program, Paris France.
10. **Groves, C.** The annual Board of Director's Meeting of the Karst Waters Institute, Denver Colorado.
11. **Kambesis, P. and B. Medley.** (2006) *The International Symposium on Groundwater in Mediterranean Countries*, Malaga, Spain, April 2006.
12. **Berdeaux, G. C. Groves* and R. Toomey.** "Developing Relations Between Tour Cave Managers and University Scientists." National Caves Association.
13. **Groves, C.** "Groundwater sensitivity Mapping of the Barren River Area Development District, Kentucky." The Barren River Area Development District Executive Council.
19. **Groves, C.** "Water Challenges in Southwest China's Karst Regions.", The Harvard University Fairbank Center Special Expanded Session on Water, the Environment, Public Health, and Public Policy in China. Cambridge, Massachusetts.

IASS:

1. (2005) 117th Meeting of the Astronomical Society of the Pacific, Tucson AZ 14 Sept 05
2. (2005) Stellar Evolution at Low Metallicity: Mass Loss, Explosions, Cosmology" (August 15-19, 2005, Tartu, Estonia): *Relativistic Jets: The Common Physics of AGN, Microquasars and Gamma-Ray Bursts*
3. 16th Argonne Undergraduate Symposium
4. 207th Meeting of the American Astronomical Society
5. Posters at the Capital
6. 208th American Astronomical Society Meeting in Calgary (Canada)
7. 12th Annual Kentucky EPSCoR Conference *Exploring Shared Interests with National Labs*
8. (2006) Computational Science in the Classroom - National Computation Science Institute MMTH (Bowling Green, KY, US) 6/05/2006 - 6/09/2006
9. (2006) Teacher Resource Agent Annual - Hands-on Universe Yerkes Observatory (Williams Bay, WI, US) 6/26/2006 - 6/27/2006
10. (2006) Variable Quasars - Beta Testing - START Collaboratory Yerkes Observatory (Williams Bay, WI, US) 6/28/2006 - 6/30/06

Appendix E. Faculty and student paper presentations at meetings.

Papers presented by Faculty or Staff at National or International Meetings (* denotes presenter)

ICSET

1. **Pan, W.-P.** (2005) "Hg Emission, Measurement and Control." Allegheny Energy, Greensburgh, PA, September 12, 2005.
2. **Pan, W.-P.** (2005) "Hg Emission, Measurement, and Control." Lansing Board of Water and Light, Lansing, MI, September 15, 2005.
3. **Pan, W.-P.** (2005) "Hg Emission, Measurement, and Control." St. John Electric Power, Jacksonville, FL, September 30, 2005.
5. **Cao*, Y., Z. Cheng and W.-P. Pan.** (2005) "Experimental Study of Multi-Pollution Control Devices on Mercury Removal." Presented at Emerging Technologies for a Sustainable Environment Conference, South Padre Island, Texas, October 20, 2005.
6. **Cao*, Y., Z. Cheng and W.-P. Pan.** (2005) "Development of a Method for Measuring Carbon Balance in the Chemical Sequestration of CO₂." Presented at Emerging Technologies for a Sustainable Environment Conference, South Padre Island, Texas, October 21, 2005.
4. **Pan, W.-P.** (2005) "Mercury Emission and Control Technologies: Putting Research into Practice." Chemistry Seminar presentation at Cleveland State University, Cleveland, Ohio, October 21, 2005.
5. **Pan, W.-P.** (2006) "Application of Thermal Analysis to Nanotubes and Nanocomposites." Presentation at Annual Symposium of Thermal Analysis Forum of Delaware Valley, University of Pennsylvania, Philadelphia, PA, March 7, 2006.
6. **Pan, W.-P.** (2006) "Introduction of the Institute for Combustion Science and Environmental Technology: Putting Research into Practice." Presentation to National Academy of Science (NAS) and Chinese Delegation Visit to U.S. at U.S.

Department of Energy – National Energy Technology Laboratory, Pittsburgh, PA, March 29, 2006.

7. **Pan, W.-P.** (2006) “Synthesis and Characterization of Polystyrene/Organo Montmorillonite Nanocomposites.” Oral presentation at 2006 TA Instruments Users Meeting & Symposium, Newport, RI, May 10, 2006

KCC:

1. **Foster, S. A.** (2005) “The Swimming Rabbit of Fulton County: Exploring the Context of Climatic Data.” National Weather Service Center Region Sub-regional Climate Services Meeting, Champaign, Illinois, August 3-4, 2005.
2. **Foster, S. A. and A. Littell.** (2005) “A Climatology of Cold Waves Impacting Kentucky.” 2nd Midwest Extreme and Hazardous Weather Regional Conference, Champaign, Illinois, October 14-15, 2005.
3. **Foster, S. A. and A. Littell.** (2005) “The Nature and Frequency of Cold Waves Affecting Kentucky, 1897-2005.” Kentucky Academy of Science 91st Annual Meeting, Richmond, Kentucky, November 11-12, 2005.
4. **Dobler, S.** (2005) “Using climate data in K-12 classrooms.” Lexington, Kentucky, November 4, 2005.
5. **Mahmood, R.** (2006) “Agricultural Cool Island.” 102nd Annual Meeting of the Association of American Geographers, Chicago, IL, 7-11 April, 2006.
6. **Foster, S.A., J. Yan.** (2006) “Visual Data Mining in Historical Drought Data: A Case Study in Kentucky.” 102nd Annual Meeting of the Association of American Geographers, Chicago, IL, April 7-11, 2006.
7. **Foster, S.A.** (2006) “Developing the Kentucky Mesonet: Some Early Experiences.” Annual Meeting of the American Association of State Climatologists, Rapid City, SD, June 21-23, 2006.

MCC:

1. **Autry, J.K., E. Conte, K.R. Reid and Q. Zhao.** (2005) “Pseudostationary Phases for Solid Phase Extractions.” Oral presentation at American Chemical Society Meeting, Washington, D.C., August 28, 2005.
2. **Conte, E.D.** (2005) “Environmental Education for Appalachian Students and Teachers.” Poster presentation at NSF Broader Impacts Symposium, American Chemical Society Meeting, Washington, D.C., August 29, 2005.
3. **Chinn, L.E., D. Choi and Y.-S. Shon.** (2005) “Convergent Synthesis of Dendron-Functionalized Gold Nanoparticles.” Poster presentation at The Division of Polymeric Materials: Science and Engineering, The American Chemical Society, Washington, DC, 2005.
4. **Gibson, S., S. Isaacs, Y.-S. Shon and A. Small.** (2005) “Chemical and Heating Treatments of Stable Ionic Monolayer-Protected Gold Nanoparticles.” Poster presentation, Particles 2005, San Francisco, CA.
5. **Buthelezi, T. and L. Ren.** (2005) “Fluorescence Quenching of Chlorophyll *a* by Gold Nanoparticles.” Oral presentation at The Southeastern Regional American Chemical Society Meeting, Memphis, Tennessee, November 2, 2005.
6. **Shon, Y.-S.** (2005) “Ionic Monolayer-Protected Gold Clusters (IMPCs): Spectroscopic Response to Chemical Treatments.” The Southeastern Regional American Chemical Society Meetings, Memphis, Tennessee, November 1-4, 2005. (*Invited paper*).
7. **Zeng, T.** (2005) The annual meeting of the Kentucky Academy of Science, Richmond, KY, November 11, 2005.
8. **Zeng, T.** (2005) “Plastic Grätzel Solid Solar Cells Nanoconstructed by Poly(thiophene).” Poster presentation at Materials Research Society Annual Conference, Boston, MA, November 27-December 2, 2005. Tingying Zeng also attended the NSF, NIH, DOD proposal writing workshop at this conference.
9. **Burris, S.** (2006) “Hydrogen Bonding in a Molecular Wheat Field: Probing the Apparent Surface pK_a's of Acid-thiolate Self-assembled Monolayers.” Invited Chemistry Department Seminar Series, University of Memphis, Memphis, Tennessee, March 31, 2006.

10. **Choi, D., Y.-S. Shon.** (2006) "Convergent Synthesis of Electroactive Nanoparticle-Cored Dendrimers. Presented at the Division of Inorganic Chemistry, The American Chemical Society, Atlanta, Georgia, March 26-30, 2006 [231, INOR-347].

❑ **Students participating and presenting papers in local conferences and competitions:**

AMSI:

1. **Adams, D., C. Billings, C. Bowlds, J. Kane, A. Morgan, J. Nelson, A. Parker, K. Reid, J. Sanders, J. Tinnell, J. Todd, R. Wieck, J. Whelan.** (2005) Habitat for Humanity, Big Reds Blitz, Volunteer and Community Service day During MASTER Plan Bowling Green, KY – August 25th, 2005.
2. **Benz, B., B. Corcoran, E. Lahm, M. Nett, R. Slaughter, R. Wieck.** (2006) American Institute of Architecture Students, Midwest Conference, Lexington, KY, March 24th-26th, 2006.
3. **Benz, B., B. Corcoran, L.R. Dinwiddie, C. Harris, L. Lee, M. Nett.** (2006) American Institute of Architecture Students, National Convention American Institute of Architects—Los Angeles, CA June 7, 8, 9, 2006.

API:

1. **Morgan, T.** (2005) "Development and characterization of micro-hall sensors based on high drift velocity materials." WKU Physics Colloquia, Bowling Green, Ky, August 2005.
2. **Board, J. and A. Barzilov.** (2006) "Integrating Wireless Networking for Medical Monitoring." The 36th Annual WKU Student Research Conference, Bowling Green, KY (April 8, 2006).
3. **Howard, J. and A. Barzilov.** (2006) "Analysis of Space Propulsion Systems for Deep Space Flight Missions." The 36th Annual WKU Student Research Conference, Bowling Green, KY (April 8, 2006).
4. **Barzilov, A., J. Board, Houchins, J. Howard, E., T. Morgan, I. Rice and P. Womble.** (2006) "Elemental Analysis Using Pulsed Fast Neutrons." The 36th Annual WKU Student Research Conference, Bowling Green, KY (April 8, 2006).
5. **Barzilov, A., J. Board, D. Harper, E. Houchins, T. Morgan, K. Moss, J. Paschal, I. Rice and P. Womble.** (2006) "Rigaku D-Max B XRD: A Materials Characterization Tool for IBMAL." The 36th Annual WKU Student Research Conference, Bowling Green, KY (April 8, 2006).
6. **Barzilov, A., L. Hopper, T. Morgan, K. Moss and P. Womble.** (2006) "Rail Tank Car Leakage Detection System (RLEAKS)." The 36th Annual WKU Student Research Conference, Bowling Green, KY (April 8, 2006).
7. **Hardin, D. and P. Womble.** (2006) "Public Relations' Role in a Scientific Institute."
8. **Rice, I. and P. Womble.** (2006) "Behavior of a Sodium Iodine Detector under Neutron Irradiation."

BIOTECH:

1. **DiLeo, J. and S. Jacobshagen.** (2006) "A PCR Test for the Ble Gene in *Chlamydomonas*." 36th Annual WKU Sigma Xi Research Conference. April 18, 2006.
2. **Chandler, T and S. Jacobshagen.** (2006) "Developing an RNA interference construct for the plant-like cryptochrome in *Chlamydomonas*." 36th Annual WKU Sigma Xi Research Conference. April 18, 2006.
3. **King, R., A. Wright.** (2006) "Sequence analysis of Bacteriophage HK239." 36th Annual WKU Sigma Xi Research Conference. April 18, 2006.
4. **Miles, Courtney and Rodney A King.** Sequence annotation of the bacteriophage HK639 genome and the identification of the phage integration site in the *Escherichia coli* chromosome. 36th Annual WKU Sigma Xi Research Conference. April 18, 2006.

5. **King, R. and C. Pendleton.** (2006) "A double agar overlay method to identify bacteriophages that are sensitive to mutations in *Escherichia coli* RNA polymerase." 36th Annual WKU Sigma Xi Research Conference. April 18, 2006.
6. **King, R., K. Philips and D. Poppy.** (2006) "First evidence for *Wolbachia* in a superfamily of beetles." 36th Annual WKU Sigma Xi Research Conference. April 18, 2006.
7. **King, R. and N. Wheet.** (2006) "Using Bioinformatics to understand the clear plaque phenotype of Bacteriophage HK75." 36th Annual WKU Sigma Xi Research Conference. April 18, 2006.
8. **Davis, C.D. and L. Kullma.** (2006) "Diet affects immunologically relevant gene expression in brains of infected mice." Sigma Xi Student Research Conference, Bowling Green, KY, April 18, 2006. Second Place, Undergraduate Research Presentation.
9. **Davis, C.D. and Y. Zho.** (2006) "Analysis of gene expression in mouse brains during *Toxoplasma gondii* infection." Sigma Xi Student Research Conference, Bowling Green, KY, April 18, 2006. Third Place, Undergraduate Research Presentation.
10. **Davis, C.D. and R. Shryock.** (2006) "The Effect of Diet in C57Bl6/J Mice Infected With the Human Pathogen, *Toxoplasma gondii*." Sigma Xi Student Research Conference, Bowling Green, KY, April 18, 2006.
11. **Chavarria-Smith, J.* and N.A. Rice.** (2006) "Phosphorylase Kinase Coordinated Gene Expression Using Deficient Mice." Sigma Xi Student Research Conference. [talk].
12. **Dodson, M.* and N.A. Rice.** (2006) "Isolation of the Promoter Region of the PHKB Gene." Sigma Xi Student Research Conference. [talk].
13. **Elliott, N.E.* and N.A. Rice.** (2006) "Muscle Specific Transcriptional Regulation of the PHKG1 Gene." Sigma Xi Student Research Conference. [talk].
14. **Winchester, J. S.* and N.A. Rice.** (2006) "Tissue Expression Profiles of Phosphorylase Kinase Determined by Computational Analysis of Expressed Sequence Tags." Sigma Xi Student Research Conference. [talk].

ESC:

1. **Collignon, K., B. Cox, H. Crawford, K. Vencill and J. Wilson.** The Kentucky Section ASCE Annual Meeting in Lexington, KY. October 7th, 2005.

HERI:

1. **Croskrey, A.,** (2006) "Geologic and Hydrologic Observations at Wanhua Cave, Hunan, China." 2006 WKU Sigma Xi Student Research Conference, Bowling Green, Kentucky.
2. **Hatcher, B.** (2006) "A Comparison of Zero Tension Lysimeter Prototypes." 2006 WKU Sigma Xi Student Research Conference, Bowling Green, Kentucky.
3. **Hendrickson, M.** (2006) "Using LIDAR and Aerial Photography to Evaluate Karst Features in the Tongass National Forest, Alaska." 2006 WKU Sigma Xi Student Research Conference, Bowling Green, Kentucky.
4. **Kovarik, J.** (2006) "Karst Resource Assessment of Western Kentucky University's Upper Green River Biological Preserve." 2006 WKU Sigma Xi Student Research Conference, Bowling Green, Kentucky. (Third Place Geography Graduate Division)
5. **Sharp, S.** (2006) "Assessment of Atrazine Within a Karst Landscape in the Rough River Lake Reservoir, Kentucky." 2006 WKU Sigma Xi Student Research Conference, Bowling Green, Kentucky. (First Place Graduate Geography Division).

IASS:

1. **Holcomb, M., J. Maune, C. Poteet, S. Smith and R. Walter.**

ICSET:

1. **Lineberry, Q. and W.-P. Pan.** (2006) "Characterization of Modified Carbon Nanotubes by Thermogravimetry-Mass Spectrometry and Pyrolysis-Gas Chromatography/Mass Spectrometry." Graduate student oral presentation at Western Kentucky University Sigma Xi Student Research Conference, Bowling Green, Kentucky, April 7-8, 2006. *Honorable Mention Award – Q. Lineberry.*

2. **Chen, Z., W.-P. Pan and Y. Zhang.** (2006) "CO₂ Capture Using Activated Carbon Made from Chicken Waste." Graduate Student oral presentation at Western Kentucky University Sigma Xi Conference, Bowling Green, KY, April 7-8, 2006.
3. **Cao, Y., B. Casenas, W.-P. Pan and Y. Zhang.** (2006) "Kinetics Investigation on Direct Reduction of CuO by Coal in Chemical Looping Combustion Using High Heating Rate Thermogravimetric Analysis Techniques." Poster presentation at Western Kentucky University Sigma Xi Conference, Bowling Green, KY, April 7-8, 2006. *First place award – Bianca Casenas.*

MCC:

1. **Chapman D. and K.M. Williams.** (2006) "NMR Studies of the Reaction of Bulky and Nonbulky Platinum Complexes with a Tetrapeptide." Oral presentation at WKU Sigma Xi Student Research Conference, Bowling Green, KY, April 7-8, 2006.
2. **Chmely, S.C. and K.M. Williams.** (2006) "Reaction of Selenomethionine with Platinum Complexes." Oral presentation at WKU Sigma Xi Student Research Conference, Bowling Green, KY, April 7-8, 2006.
3. **Davis, B.M. and K.M. Williams.** (2006) "Effects of Amine Ligand Bulk on the Rate of Reaction of Platinum(II) Diamine Complexes with Guanine and Methionine Residues." Oral presentation at WKU Sigma Xi Student Conference, Bowling Green, KY, April 7-8, 2006.
4. **Poteet, C.D. and T. Zeng.** (2006) "Synthesis of TiO₂ Nanowires Using Low Temperature Sol Gel Technique and Solar Cell Applications." Oral presentation at WKU Sigma Xi Student Research Conference, Bowling Green, KY, April 7-8, 2006.
5. **Isaacs, S. and Y.-S. Shon.** (2006) "C60/Gold Nanoparticle Hybrid Films by Layer-by-Layer and In-Situ Cross Linking Assembly." Oral presentation at WKU Sigma Xi Student Research Conference, Bowling Green, KY, April 7-8, 2006. *First place in GRC.*
6. **Davis, B.M. and C. Webb.** (2006) "Direct Measurement and Observation of the Triple Point of Carbon Dioxide." Poster presentation at WKU Sigma Xi Student Research Conference, Bowling Green, KY, April 7-8, 2006.
7. **Campbell, C., L. Clark, D. Hartman, C. Webb.** (2006) "Limestone-Based Material for Arsenic Removal from Drinking Water." Poster presentation at WKU Sigma Xi Student Research Conference, Bowling Green, KY, April 7-8, 2006.
8. **Campbell, C., L. Clark, S. Dawadi, A. Dockery and C. Web.** (2006) "Occurrence and Distribution of Mercury in Mammoth Cave National Park." Poster presentation at WKU Sigma Xi Student Research Conference, Bowling Green, KY, April 7-8, 2006.
9. **Conte, E. and K. Pickering.** (2006) "Extraction of Phenol Using Silica-Surfactant Surfaces." Poster presentation at WKU Sigma Xi Student Research Conference, Bowling Green, KY, April 7-8, 2006.
10. **Buthlezi, T., C. Davies and K. Milner.** (2006) "Binding of Anthracene to Various Cyclophanes in Dichloromethane." Poster presentation at WKU Sigma Xi Student Research Conference, Bowling Green, KY, April 7-8, 2006.
11. **Norris, J. and T. Zeng.** (2006) "Application of CdSe Quantum Dots in Grätzel Solar Cells." *J. Norris was awarded second prize for undergraduate student research poster presentation.*

□ **Students participating (and presenting papers) in regional conferences and competitions:**

API:

1. **Barzilov, A., D. Harper, T. Morgan and P. Womble.** (2006) "Beam Line Optics for 2.5 MeV Van de Graaff Particle Accelerator." The 5th Annual Posters-at-the-Capitol Conference, Frankfort, KY.

2. **Barzilov, A., D. Hardin, S. McMurray and P. Womble.** (2006) "Biometric Fingerprint Access System for Critical Infrastructure Protection." The 5th Annual Posters-at-the-Capitol Conference, Frankfort, KY.

BIOD:

1. **Ambrose, K., T. Thomas, T. Evans, T. Hughes, B. Polen, T. Powell, C. Thomas.** (2005) Kentucky Academy of Science, 91st Annual Meeting, Richmond, KY. (November, 2005).
2. **LeGates, S.** (2006) Joint meeting of the Tennessee and Kentucky Chapters of the American Fisheries Society, Land Between-the-Lakes, TN. (March 2006).

BIOTECH:

1. **King, R. and C. Miles.** (2005) "Immunity Region of Bacteriophage HK639 Encodes an Antiterminator RNA." Kentucky-Tennessee Branch meeting of the American Society for Microbiology, Nashville, TN. Sept. 30-Oct.1, 2005.
2. **Abo, M. and M.L. Risner.** (2005) "Wavelength discrimination in the zebrafish (*Danio rerio*)." Kentucky Academy of Science Meeting. Richmond, KY. November 10-12, 2005.
3. **Alice, L.A. and K. Ambrose.** (2005) "Clarification of basal relationships in *Rubus* (Rosaceae)." Kentucky Academy of Science annual meeting, Richmond, KY. November 10-12, 2005.
4. **Alice, L.A. and T.M. Dodson.** (2005) "Diversity and relationships of Bhutanese *Rubus* (Rosaceae)." Kentucky Academy of Science annual meeting, Richmond, KY. November 10-12, 2005. [*Tied for 1st place award in Botany & Microbiology section*].
5. **Elliott, N.** (2005) Kentucky Academy of Science 91st Annual Meeting, Richmond, Kentucky. November 10-12, 2005. (*second place in the Cell and Molecular Biology division*).
6. **Evans, T.** (2005) "A Simulation Study of the Genetic Regulatory Hierarchy for Butterfly Eyespot Focus Determination." Kentucky Academy of Science 91st Annual Meeting, Richmond, Kentucky. November, 10-12, 2005.
7. **Hancock, J.** (2005) Kentucky Academy of Science 91st Annual Meeting, Richmond, Kentucky. November 10-12, 2005.
8. **Hughes, T.** (2005) "Recombination mapping of P-element transposons in *Drosophila*: A new set of gene mapping exercises for an undergraduate genetics course." Kentucky Academy of Science 91st Annual Meeting, Richmond, Kentucky. November 10-12, 2005. (*1st Place Education Division for Graduate Students*).
9. **King, R. and A. Wright.** (2005) "Superinfection Exclusion by Bacteriophage HK239 is Mediated by More than One Gene Product." Kentucky Academy of Science, Richmond, KY. November 10-12, 2005.
10. **Polen, B.** (2005) "PiRaTe-PYG: A New Genetic Construct for Studying Gene Expression in Butterflies." Kentucky Academy of Science 91st Annual Meeting, Richmond, Kentucky. November 10-12, 2005.
11. **Powell, T.** (2005) "Development of a fluorescent Southern Blot protocol for use with a Molecular Dynamics Storm Imaging System." Kentucky Academy of Science 91st Annual Meeting, Richmond, Kentucky. November 10-12, 2005.
12. **Sahi, J.** (2005) "Optic nerve regeneration in the adult zebrafish: a physiological and anatomical investigation." Kentucky Academy of Science Meeting. Richmond, KY. November 10-12, 2005.
13. **Thornberry, T.** (2005) "Dark-adaptation functions of the developing zebrafish." Kentucky Academy of Science Meeting. Richmond, KY. November 10-12, 2005.
14. **Mahmood, H.** (2006) "Bringing STEM Role Models to Every Classroom in Kentucky." Posters-at-the-Capitol, Frankfort, KY. February 2, 2006.
15. **Hancock, J.M. and N.A. Rice.** (2006) "Characterization of the Human PHKG2 Promoter." 5th Annual Posters-at-the-Capitol, Frankfort, KY. February 2, 2006.
16. **Zhou, Y.** (2006) "Analysis of Gene Expression in Mouse Brains During *Toxoplasma gondii* infection." TriBeta District Convention, Gatlinburg, TN. March 29-March 31, 2006. (*2nd place in Brooks Award Competition*).

17. **Kullman, L.** (2006) "Diet Affects Immunologically Relevant Gene Expression in Brains of *Toxoplasma gondii* Infected Mice." TriBeta District Convention, Gatlinburg, TN. March 29-March 31, 2006.
18. **Rice, N.A., E.C. Rouchka and Winchester, J.S.*.** (2006) "Tissue Expression Profiles of Phosphorylase Kinase Determined by Computational Analysis of Expressed Sequence Tags." UT-ORNL-KBRIN Bioinformatics Summit, Lake Barkley State Park, Cadiz, KY. [poster].

CCKS:

1. **Brewer, J.*, N.C. Crawford and L.A. Croft.** (2005) "Microgravity Subsurface Investigation of the Fruit of the Loom Distribution Building, Bowling Green, Kentucky." Kentucky Academy of Science Annual Meeting, Eastern Kentucky University, Richmond, Kentucky, November 10-12, 2005.
2. **Cesin, G.* and N.C. Crawford.** (2005) "The Use of Microgravity, Electrical Resistivity and Dye Tracing to Identify the Lost River Cave Beneath the Egypt Parking Lot, Bowling Green, KY." Kentucky Academy of Science Annual Meeting, Eastern Kentucky University, Richmond, Kentucky, November 10-12, 2005.
3. **Brewer, J., G. Cesin, M. Coffelt*, N.C. Crawford, L.A. Croft, , M. Firkins and N. Rinehart.** (2005) "Subsurface Geophysical Investigation Along the Proposed Pennyrile Parkway Extension, Christian County, Kentucky." Kentucky Academy of Science Annual Meeting, Eastern Kentucky University, Richmond, Kentucky, November 10-12, 2005.
4. **Brewer, J., M. Coffelt, N.C. Crawford, R. Elrod, M. Firkins*, C. Martin, and N. Rinehart.** (2005) "By-Pass Cave Dye Trace Investigation, Bowling Green, Kentucky." Kentucky Academy of Science Annual Meeting, Eastern Kentucky University, Richmond, Kentucky, November 10-12, 2005.
5. **Crawford, N.C., L.A. Croft and Rinehart, N.*.** (2005) "In Search of the Lost River: Geophysical Subsurface Investigation in the Vicinity of Lost River Cave Valley, Bowling Green, Kentucky." Kentucky Academy of Science Annual Meeting, Eastern Kentucky University, Richmond, Kentucky, November 10-12, 2005.
6. **Tallent, J.*, N.C. Crawford and P. Kambesis.** (2005) "Application of Geophysics and GIS for Greater Accuracy in Karst Subsurface Investigations". Kentucky Academy of Science Annual Meeting, Eastern Kentucky University, Richmond, Kentucky, November 10-12, 2005.

CWRS:

1. **Andrew, K.*, (co-authors) A. Ernest, T. Lyon and S. Tope.** (2005) "Using ARGIS Server to Provide GIS to Rural Water Districts." The 2005 KY GIS Conference in Bowling Green, KY. Spatial Data Integrations, Inc. August 22-25, 2005.
2. **Kumar, A.T.*, (co-authors) K. Andrew, and M. Mostafa.** (2005) "Tool for Mining Spatially Referenced Water Quality Data." The 2005 KY GIS Conference in Bowling Green, KY. August 22-25, 2005.
3. **Tope, S.* (co-authors) J. All, K. Andrew and A. Ernest.** (2005) "Utilizing Integrated-GIS to Combat Bioterrorist Threats & Protect Drinking Water Supply." The 2005 KY GIS Conference in Bowling Green, KY. August 22-25, 2005.
4. **Payton, S.** (2005) "Benchmark for Developing Small Rural Water System GIS." The 2005 Water Professionals Conference in Covington, KY. September 11-14, 2005.
5. **Tope, S.** (2005) "Utilizing Integrated-GIS to Combat Bioterrorist Threats & Protect Drinking Water Supplies." The 2005 Water Professionals Conference in Covington, KY. September 11-14, 2005.

ESC:

1. **Baker, M.E., D. Brown, A. Dobbins, R. Farris, J. Figueroa, B. Hellinger, E. Holloway, K. Ketterman, A. Marshall, J. Merritt, J. Nash, A. Pape, J. Petrino, N. Plemons, J.R. Sandusky, E. Schmale, M. Siebert, J. Silva, A. Tabor, J. Traugher, L. Villalpando, J. Wallace and R. Wimsatt.** (2006) The ASME

District C Student Conference, the Student Design Competition, Rolla, MO. March 4, 2006.

2. **Howard, M.*, S. Miller*, T. Rippy* and S. Wilson.** (2006) "Autonomous Robot for Detecting Subsurface Voids and Tunnels using Microgravity." The International Society for Optical Engineering Defense and Security Symposium, Orlando, Florida, April 2006.

HERI:

3. **Broome, J.** (2005) "Simulation Modeling of Relations Between Climate and Karst Aquifer Evolution." in Kentucky Academy of Science Annual Meeting, Eastern Kentucky University, Richmond, Kentucky, November 10-12, 2005. (*Best Paper-tie*).

IASS:

1. **McMurray, S. Smith and R. Walters.**

KCC:

1. **Littell, A.** (2005) "Seasonal Variation of Severe Weather Events across South Central Kentucky: A Natural Hazard Database to Aid in Disaster Mitigation Planning." 2nd Midwest Extreme and Hazardous Weather Regional Conference, Champaign, Illinois, October 14-15, 2005.
1. **Buthelezi, T., C. Davies* and K. Milner*.** (2005) "Measurement of Polyaromatic Hydrocarbons (PAHs)-Cyclophane Binding Properties Using a Portable Spectrofluorometer." The 57th Southeast/61st Southeastern Regional Meeting, Memphis, TN, November 1-4, 2005. (*Poster*).
2. **Buthelezi, T.* and L. Ren.** (2005) "Fluorescence Quenching of Chlorophyll *a* by Gold Nanoparticles." The 57th Southeast and 61st Southwest Regional ACS Meeting, Memphis, TN, November 1-4, 2005. (*Oral Presentation*).
3. **Chmely, S.C.* and K.M. Williams.** (2005) "Interaction of Platinum Complexes with Selenomethionine." The 57th Annual Southeast Regional Meeting of the American Chemical Society, Memphis, TN, November 1-4, 2005. (*Poster*).
2. **Littell, A.** (2005) "Forecasting, Radar and Damage Analysis of the 13 July 2004 Derecho through Central Kentucky." Kentucky Academy of Science 91st Annual Meeting, Richmond, Kentucky, November 11-12, 2005.
3. **Foster, S.A., Kendrick, D. and R. Mahmood.** (2005) "Relationship between Mesometeorological Patterns and Ground Ozone Concentration Variability." Kentucky Academy of Science 91st Annual Meeting, Richmond, Kentucky, November 11-12, 2005.
4. **Kendrick, D. and R. Mahmood.** (2005) "Relationship Between Mesometeorological Patterns and Ground Ozone Concentration Variability." The 60th Annual meeting of Southeastern Division, The Association of American Geographers, West Palm Beach, FL. November 20-22, 2005. (*Poster*).

MCC:

1. **Zeng, T. and students.** (2005) The Nashville Region American Chemical Society Meeting on September 21, 2005.
2. **Shon, Y.-S.** (2005) "Ionic Monolayer-Protected Gold Clusters (IMPCs): Spectroscopic Response to Chemical Treatments." The Southeastern Regional American Chemical Society Meetings, Memphis, TN, November 1-4, 2005. (*Invited Paper*).
3. **Burris, S. and W. Maupin*.** (2005) "Probing the Relationship between Surface Roughness and Acid-Base Behavior of Carboxylate SAMs." The 57th Southeast/61st Southwest Joint Regional Meeting of the American Chemical Society, Memphis, TN, United States, November 4, 2005.
4. **Isaacs, S.R., W.B. Ko.** (2005) "The Chemical, Thermal, and Ultrasonic Stabilities of Hybrid Nanoparticles and Nanoparticle Multilayer Films." The Southeastern Regional American Chemical Society Meetings, Memphis, TN, November 1-4, 2005.

5. **Blake, A., S.R. Isaacs, R. Miller*, S Y.-S Shon.** (2005) "A Facile Synthesis of Ionic Monolayer-Protected Silver Sulfide and Palladium Nanoparticles." The Southeastern Regional American Chemical Society Meetings, Memphis, TN, November 1-4, 2005.
6. **Alicie, B.*, A. Moore and K.M. Williams.** (2005) "Reaction of Ruthenium(III) Complexes with Heterocyclic Ligands and Glutathione." The 91st Annual Kentucky Academy of Science Meeting, Richmond, KY, November 10-12, 2005. (*Poster*).
7. **Buthelezi, T., C. Davies* and K. Milner.** (2005) "Corrals Serve as Sensors for Polyaromatic Hydrocarbons (PAHs) in Solution." The Kentucky Academy of Science, Richmond, Kentucky, November 10-12, 2005. (*Poster*).
8. **Conte, E. and Q. Zhao*.** (2005) "Increasing the Hydrophobicity of Surfactant Immobilized Sorbents." The Kentucky Academy of Science, Eastern Kentucky University, November 10-12, 2005. (*oral presentation*).
9. **Conte, E., R. Dean and Kali Pickering*.** (2005) "Extraction of Phenols Using Admicelle Coated Silica," The Kentucky Academy of Science, Eastern Kentucky, November 10-12, 2005. (*oral presentation*).
10. **Conte, E., T. Parsons* and J. Scott.** (2005) "Atrazine and Selected Metabolites by High Performance Liquid Chromatography." The Kentucky Academy of Science, Eastern Kentucky University, November 10-12, 2005. (*poster*).
11. **Davis, B.M.*, K.M. Williams.** (2005) "Effects of Amine Ligand Bulk on the Rate of Reaction of Platinum(II) Diamine Complexes with Guanine and Methionine Residues." The 91st Annual Kentucky Academy of Science Meeting, Richmond, KY, November 10-12, 2005. (*oral presentation*).
12. **Isaacs*, S.R., Y.-S. Shon and A. Small.** (2005) "Synthesis of Ionic Monolayer-Protected Gold Nanoparticles: Spectroscopic Response to Chemical Treatment." The Kentucky Academy of Science, Eastern Kentucky University, Richmond, KY, November 10-12, 2005. (*First place in GRC*).
13. **Norris*, C. and T. Zeng.** (2005) "Building Ultrathin Films by Atomic Layer Deposition." The Kentucky Academy of Science Meeting, Richmond, KY, November 10-12, 2005. (*Oral presentation*). *Fourth place for undergraduate student research awarded to Cassie Norris.*

□ **Students participating (and presenting papers) in national conferences and competitions:**

API:

1. **Barzilov, A. and J. Craft.** (2005) "Investigation of Ranges for Proton Recoil Reaction Products in Gas Mixtures of Position Sensitive Neutron Detectors." The 16th National Argonne Undergraduate Symposium, Chicago, IL, Nov. 4-5, 2005.
2. **Barzilov, A., J. Craft, L. Hopper, S. G. McMurray, R. Moore, T. Morgan, J. Paschal, B. Wallace and P.C. Womble.** (2005) "Design and Construction of the WKU Ion Beam Analysis Laboratory." The 16th National Argonne Undergraduate Symposium, Chicago, IL, Nov. 4-5, 2005.
3. **Barzilov, A., R. Moore and P. Womble.** (2005) "Threat Level Determination through Elemental Analysis." The 16th National Argonne Undergraduate Symposium, Chicago, IL, Nov. 4-5, 2005.
4. **Morgan, T. and S. Whitteburg.** (2005) "Determining the phase boundary of circle and square nanomagnets." Sigma Xi Student Research Conference, Seattle, WA Nov. 4-5, 2005.

5. **Barzilov, A., J. Board, L. Hopper, J. Howard, R. Moore, T. Morgan, K. Moss, J. Paschal, B. Wallace and P.C. Womble.** (2006) "Inexpensive Robot Platforms for Detection and Neutralization Applications." *Proceedings of the 7th International Symposium on Technology and the Mine Problem*, Monterrey, CA.

AREC:

1. **Berry, L., P. Burmeister, J.J. Campbell, R. Dalton, M. Futrell, L. Geary, C. Goley, B. Griffith, C. Harris, J. Johnson, C. Kenner, F. Korthaus, J. Lauria, A. Massey, A. Moore, A. Moss, J. Pedigo, P. Price, S. Priddy, D. Tabor and B. Warren.**

BIOD:

1. **Orozco, J.** (2005) Entomology Society of America, Ft. Lauderdale, Dec. 2005.
2. **Akotsen-Mensah, C.** (2005) Entomology Society of America, Ft. Lauderdale, Dec. 2005.
3. **Jones, N.** (2006) American Society of Mammalogists, University of Massachusetts, Amherst, MA, June 2006.

BIOTECH:

1. **Mason, B.P.** (2005) General Meeting of the American Society for Microbiology. American Society for Microbiology, Washington D.C.
2. **Watson, L.J.** (2005) Annual Meeting of the American Society of Parasitologists. American Society of Parasitologists, Mobile, Alabama. July 8-11, 2005.
3. **Elliott, N.E.* and Rice, N.A.** (2006) "Isolation of the promoter region of the PHKG1 gene." American Society of Biochemistry and Molecular Biology annual meeting, San Francisco, CA. [poster].
4. **Hancock, J.M.* and Rice, N.A.** (2006) "Characterization of the Human PHKG2 Promoter." American Society of Biochemistry and Molecular Biology annual meeting, San Francisco, CA. [poster].
5. **Hughes, T. M.** (2006) "Molecular phylogenetics and the evolution of mimicry in the butterfly genus *Basilarchia*." 57th Annual Meeting of the Lepidopterists' Society, Gainesville, Florida, June 2006.
6. **Powell, T. B.** (2006) "Molecular Forensics in Butterflies: The Origins of *Basilarchia* form "rubidus" in Kentucky." 57th Annual Meeting of the Lepidopterists' Society, Gainesville, Florida, June 2006.
7. **Shehan, T. S.** (2006) "Applications of AFLP-based DNA fingerprinting to the study of the Lepidoptera." 57th Annual Meeting of the Lepidopterists' Society, Gainesville, Florida, June 2006.

CCKS:

1. **Brewer, J.*, N.C. Crawford and L.A. Croft.** (2005) "Microgravity Subsurface Investigation of the Fruit of the Loom Distribution Building, Bowling Green, Kentucky." Kentucky Academy of Science Annual Meeting, Eastern Kentucky University, Richmond, Kentucky, November 10-12, 2005.
2. **Cesin, G.* and N.C. Crawford.** (2005) "The Use of Microgravity, Electrical Resistivity and Dye Tracing to Identify the Lost River Cave Beneath the Egypt Parking Lot, Bowling Green, KY." Kentucky Academy of Science Annual Meeting, Eastern Kentucky University, Richmond, Kentucky, November 10-12, 2005.
3. **Brewer, J.*, G. Cesin, M. Coffelt, N.C. Crawford, L.A. Croft, M. Firkins and N. Rinehart.** (2005) "Subsurface Geophysical Investigation Along the Proposed Pennyriple Parkway Extension, Christian County, Kentucky." Kentucky Academy of Science Annual Meeting, Eastern Kentucky University, Richmond, Kentucky, November 10-12, 2005.
4. **Brewer, J., M. Coffelt, N.C. Crawford, R. Elrod, Firkins, M.*, C. Martin and N. Rinehart.** (2005) "By-Pass Cave Dye Trace Investigation, Bowling Green, Kentucky." Kentucky Academy of Science Annual Meeting, Eastern Kentucky University, Richmond, Kentucky, November 10-12, 2005.
5. **Crawford, N.C., L.A. Croft and Rinehart, N.*** (2005) "In Search of the Lost River: Geophysical Subsurface Investigation in the Vicinity of Lost River Cave Valley, Bowling Green, Kentucky." Kentucky Academy of Science Annual

Meeting, Eastern Kentucky University, Richmond, Kentucky, November 10-12, 2005.

6. **Crawford, N.C., P. Kambesis and J. Tallent***. (2005) "Application of Geophysics and GIS for Greater Accuracy in Karst Subsurface Investigations." Kentucky Academy of Science Annual Meeting, Eastern Kentucky University, Richmond, Kentucky, November 10-12, 2005.

CWRS:

1. **All, J., K. Andrew, A. Ernest and S. Tope***. (2006) "Using Integrated-GIS to Combat Bioterrorist Threats and to Protect Drinking Water Supplies." The First Asia-Pacific Conference for ESRI Users in Hong Kong. January 12-13, 2006.

ESC:

1. **Bibelhauser, B., S. Howard and J. Martin. (2005)** The national finals of the Student Design Competition at the American Society of Mechanical Engineers (ASME) International Mechanical Engineering Congress and Exposition (IMECE). Orlando FL, November 6, 2005. (*Placed 4th out of 13 teams*).

HERI:

1. **He, S., C. Groves, D. Groves, Z. Jiang and P. Kambesis***. (2005) "Chinese/American Cooperation in Cave Exploration and Survey in Water Resource Development, Da Long Dong, Hunan China." International Congress of Speleology, Athens, Greece. August 20-28, 2005.
2. **C. Groves, D. Groves and W. Hawkins***. (2005) "A Century of Linkages and Synergy: Western Kentucky University and the Mammoth Cave System." International Congress of Speleology, Athens, Greece. August 20-28, 2005.
3. **All, J., C. Groves, P. Kambesis***. (2005) "Ghost Cave, Eastern Himalayas, Bhutan." International Congress of Speleology, Athens, Greece. August 20-28, 2005.
4. **Groves, C., Hawkins, W*, P. Kambesis***. (2005) "Potential Impacts of Acid Mine Drainage on the Hydrogeologic System of Russell Cave National Monument, Alabama, USA." International Congress of Speleology, Athens, Greece. August 20-28, 2005.
5. **Croskrey*, A., C. Groves and P. Kambesis***. (2005) "Groundwater sensitivity mapping of the Beaver Dam and Campbellsville 30' X 60' Quadrangles." International Congress of Speleology, Athens, Greece. August 20-28, 2005.
6. **Croskrey*, A., K. Downey, M. Futrell, P. C. Groves, Kambesis*, J. Kovarik*, G. Jiang, Z. Jiang and B. Tobin.** (2005) "Geologic and Hydrologic Observations from Wanhuyan Cave, Hunan, China." National meeting of the National Speleological Society, Huntsville, Alabama.
7. **Croskrey*, A., C. Groves, P. Kambesis*, J. Kovarik* and Z. Jiang.** (2005) "Chinese/American Cooperation in Cave Management and Study at Wanhua Cave, Hunan Province, China." National Cave and Karst Management Symposium, Albany, New York.
8. **Groves, C., M. Hendrickson*, P. Kambesis* and R. Kessler.** (2005) "Collaborative Efforts Between University and Non-Profit Groups in the Evaluation of Cave and Karst Resources." National Cave and Karst Management Symposium, Albany, New York.
9. **Crawford, N.C., P. Kambesis*. and J.A. Tallent.** (2005) "Correlating Geophysics and Cave Cartography for Greater Accuracy and Application." National Cave and Karst Management Symposium, Albany, New York.
10. **Kambesis*, P. and J. Kovarik.** (2005) "Cave Resource Inventories: Why are They Important?" National Cave and Karst Management Symposium, Albany, New York.
11. **Hendrickson*, M.** (2006) The Influence of Organic Acid on the Dissolution Rate of Limestone: Beaver Falls – Mop Spring, Tongass National Forest, Alaska. Karst Waters Institute William O. Wilson Scholarship (\$1,000). (*Proposal*).

IASS:

1. **Maune, J., C. Poteet, S. Smith and R. Walters.**

KCC:

1. **Baldwin*, W.M. and R. Mahmood.** (2005) "An assessment of key aspects of warm and cool season severe flash flooding in the Southern Appalachians." 21st Conference on Weather Analysis and Forecasting. Washington, D.C., August 1-5, 2005.
2. **Champlin*, D., C. Henry*, R. Mahmood, M. McLane and C. Smallcomb.** (2005) "The evolution of a warm season severe eastern Kentucky flash flood." 21st Conference on Weather Analysis and Forecasting. Washington, D.C., August 1-5, 2005.
3. **Baldwin*, W. M. and R. Mahmood.** (2006) "An assessment of key aspects of warm and cool season severe flash flooding in the southern Appalachians." 102nd Annual Meeting of the Association of American Geographers, Chicago, IL. April 7-11, 2006.

MCC:

1. **Gibson, S., S. Isaacs, Y.-S. Shon and A. Small.** (2005) "Chemical and Heating Treatments of Stable Ionic Monolayer-Protected Gold Nanoparticles." Particles 2005, San Francisco, California, August 13-16, 2005. [2-91P]
2. **Chinn, L.W., D. Choi, Y.-S. Shon.** (2005) "Convergent Synthesis of Dendron-Functionalized Gold Nanoparticles." The Division of Polymeric Materials: Science and Engineering, The American Chemical Society, Washington, D.C., August 28-September 1, 2005. [230, PMSE-434]
3. **Cutler, E., B.D. Garabato, S. Isaacs, Y.-S. Shon.** (2006) "Chemical and Heating Treatments of Stable Ionic Monolayer-Protected Gold Cluster." PITTCON 2006, Orlando, Florida, March 12-16, 2006. [1860-6P]
4. **Blake, A., S. Gibson, R. Miller, Y.-S. Shon and A. Small.** (2006) "Ionic Monolayer-Protected Metal Clusters (IMPCs) as a New Class of Stable Molecular Nanoparticles." PITTCON 2006, Orlando, Florida, March 12-16, 2006. [1860-10P]
5. **Isaacs, S., Y.-S. Shon.** (2006) "Molecular Assembly of C60-Gold Nanoparticle Hybrid Films for Device Applications." PITTCON 2006, Orlando, Florida, March 12-16, 2006.[430-28P]
6. **Buthelezi, T., C. Davies and K. Milner.** "Polyaromatic Hydrocarbons (PAHs) in Solution." PITTCON 2006, Orlando, Florida, March 12-16, 2006. (*Oral presentation*).
7. **Buthelezi, T., C. Davies and K. Milner.** (2006) "Binding of Anthracene to Various Cyclophanes in Dichloromethane." Poster presentation at The American Chemical Society, Atlanta, Georgia, March 26-30, 2006.
8. **Isaacs, S., W.-B. Ko and Y.-S. Shon.** (2006) "C60/Gold Nanoparticle Hybrid Films by Layer-by-Layer and In-situ Cross-Linking Assembly." The Division of Colloid and Surface Chemistry, The American Chemical Society, Atlanta, Georgia, March 26-30, 2006. [231, COLL-151].
9. **Isaacs, S.R., Y.-S. Shon and A. Small.** (2006) "Synthesis of Stable Ionic Monolayer-Protected Gold Clusters (IMPCs) by Anion Exchange Reaction." The Division of Inorganic Chemistry, The American Chemical Society, Atlanta, Georgia, March 26-30, 2006. [231, INOR-219]
10. **Lundin, E. and Y.-S. Shon.** (2006) "Synthesis of Nanoparticle-Cored Poly(amidoamine) Dendrimers. Presented at The Division of Inorganic Chemistry, The American Chemical Society, Atlanta, Georgia, March 26-30, 2006 [231, INOR-218].
11. **Isaacs, S.R., S. Parmley and Y.-S. Shon.** (2006) "Ionic Monolayer Protected Clusters (IMPCs): Spectroscopic Response to Chemical Treatments." The Division of Inorganic Chemistry, The American Chemical Society, Atlanta, Georgia, March 26-30, 2006. [231, INOR-213].
12. **Davis, B.M. and K.M. Williams.** (2006) "Effects of Amine Ligand Bulk on the Rate of Reaction of Platinum(II) Diamine Complexes with Guanine and Methionine Residues." Poster presentation, The American Chemical Society, Atlanta, Georgia, March 26-30, 2006.

13. **Chapman, D.J. and , K.M. Williams.** "Molecular Mechanics Predictions, Verifications, and Trends for N-acetylmethionine Reactions with Bulky Platinum Compounds." The American Chemical Society, Atlanta, Georgia, March 26-30, 2006.
14. **Chmely, S.C. and K.M. Williams.** (2006) "Reaction of Selenomethionine with Platinum Complexes." The American Chemical Society, Atlanta, Georgia, March 26-30, 2006.
15. **Alicie, B., A. Moore and K.M. Williams.** (2006) "Reaction of Ruthenium(III) Complexes with Heterocyclic Ligands and Gluthathione." The American Chemical Society, Atlanta, Georgia, March 26-30, 2006.
16. **Norris, C. and T. Zeng.** (2006) "Hybrid Grätzel Solid Solar Cells Modified by Atomic Layer Deposition." Materials Research Society Spring Conference, April 17-21, 2006. (*Poster presentation*).
17. **Zeng, T.** (2006) The DOE workshop on Basic Research and Materials for Solar Energy Utilizations while at Materials Research Society Spring Conference, April 17-21, 2006.

Appendix F. Internships and Service Learning Opportunities.

API:

1. **Board, J.** "Medical wireless sensor system"
2. **Craft, J.** "Calculation of Electric Fields for Neutron Detectors."
3. **Culver, J.** "Spectral Analysis for Acoustic Signals"
4. **Davenport, C.** "Programmable microchips for distributed sensor networks"
5. **Haley, E.** "Multiprocessor computer cluster for parallel MCNP simulations"
6. **Hardin, D.** "Public Relation in Scientific Institute"
7. **Houchins, E.** "Explosive Detection using Pulsed Neutrons"
8. **Howard, J.** "Analysis of Propulsion Systems for Deep Space Flight Missions"
9. **McGrath, C. and M. Nichols.** "Security of milk transport from farm to processor (MILK)"
10. **McMurray, S. and T. Morgan.** "Installation of 2.5 MV Van de Graaff accelerator."
11. **Moore, R.** "Explosives Detection Algorithms."
12. **Moss, K.** "Rail Tank Car Lakage Detection System (RLEAKS)"
13. **Rice, I.** "Behavior of a Sodium Iodine Detector under Neutron Irradiation"
14. **Thornsberry, M.** "Closed circle cooling of XRD x-ray source"
15. **Wallace, B.** "Specially Designed Signal Generators for the INL Explosives Detection System."

BIOD:

1. **Ambrose, K.** "NSF RUI: Molecular Phylogenetics and Allopolyploidization in *Rubus* (Rosaceae)."
2. **Beavin, L., A. Bisig, R. Brotherton, A. Hamisch, A. Jones, T. Ogunsanya, M. Ransdell, B. Smith and C. White.** "WKU/University of Nairobi Wildlife Forensics Project."
3. **Collins, B.** "Dung beetle diversity in Ghana."
4. **Crabtree, L.** "A model of lower jaw bite forces in the coyote, *Canis latrans*."
5. **DeWildt, C. and J. Speers.** "Oak Savannah Diversity Project."
6. **Evans, T., S. House, T. Hughes, C. Lee and A. Maupin.** "NIH INBRE: A Butterfly Transposon Mutagenesis Screen for the Study of Wingless Signal Transduction."
7. **Fisher, D.** "Effects of dams on fish upstream of reservoirs."
8. **Hutchins, B. and C. Thomas.** "Life histories of stoneflies."

9. **Polen, A.B., T. Powell and T. Shehan.** "NSF EPSCoR: Genetic Mapping and Germ Line transformation in the butterfly *Precis coenia*."
10. **Sandefur, M.** "Forelimb biomechanics of the eastern mole, *Scalopus aquaticus*."
11. **Smith, B.** "Phylogeny of the belostomatid water bugs."
12. **Wint, A.** "Population genetics of invasive *Rubus* in North America."

BIOTECH:

1. **Abo, M.** "Wavelength discrimination in zebrafish."
2. **Baioni, A.** "Reporter gene insertion patterns in *Chlamydomonas* mutants."
3. **Barahona, N. and S. Carraro.** "Impact of antioxidant supplementation in a murine model of Toxoplasmosis."
4. **Byrd, D.** "Developing a PCR-based assay for ble insertions in the *Chlamydomonas* genome."
5. **Cantrell, C.** "The Prevalance and Intensity of the Raccoon Roundworm (*Baylisascaris procyons*) in the Allegheny woodrat (*Neotoma magister*) in Southcentral Kentucky."
6. **Chandler, T.** "Cloning a RNA interference construct to reduce cryptochrome expression."
7. **Chavarria-Smith, J.** "Developmental gene expression profiling of the I strain mouse."
8. **DiLeo, J.** "Reporter gene detection in *Chlamydomonas* transformants by PCR."
9. **Dodson, M., N. Elliott and J. Hancock.** "Isolation and characterization of the PHKB promoter."
10. **Dodson, T.M.** "NSF RUI: Molecular Phylogenetics and Allopolyploidization in *Rubus* (Rosaceae)."
11. **Gaskill, C.** "Action spectrum for circadian clock entrainment by light in *Chlamydomonas*."
12. **Gilley, R.** "Auditory brainstem response in fishes."
13. **Glidewell, F.N. and F.C. Riddle.** August 2005-present
14. **Jewell, A.** "NSF-REU summer research project."
15. **Mason, B.**
16. **Miles, C.** "The effect of RNA polymerase mutants on RNA-mediated antitermination."
17. **Pendleton, C.** "A screen for bacteriophage that are sensitive to the E. coli rpoCY75N mutation."
18. **Petluru, V.** "Impact of antioxidant supplementation on nitric oxide levels in a murine model of toxoplasmosis."
19. **Polen, A.B., T. Powell and A. Harper.** "NIH INBRE: A Butterfly Transposon Mutagenesis Screen for the Study of Wingless Signal Transduction."
20. **Poppy, D.** "The identification of Wolbachia in Spider Beetles."
21. **Rogers, B.** "Auditory anatomy of loricariid catfish."
22. **Sahi, J.** "Anatomical recovery of zebrafish optic nerve."
23. **Schuck, J.** "Hair cell regeneration in the zebrafish ear."
24. **Sheroa, S.** "Optic nerve regeneration in zebrafish."
25. **Shryock, R.** "Gene expression analysis in a murine model of toxoplasmosis."
26. **Shumake, J.** "Characterizing growth defects in two *Chlamydomonas* mutants defective in rhythmic gene expression."
27. **Spencer-Winshester, J.** "Mechanical Regulation of Myofibroblast Apoptosis."
28. **Thompson, K.** "Genomic DNA extraction of *Chlamydomonas*."
29. **Thornberry, T.** "Development of dark-adaptation in zebrafish ERG."
30. **Thurman, T.** "Sequence analysis of bacteriophage HK239."
31. **Uessler, C.** "Localizing NMDA-receptors in the zebrafish retina."
32. **Webb, A.** "Mechanism of sound production in loricariid catfish."
33. **Wheet, N.** "Using Bioinformatics to understand the clear plaque phenotype of Bacteriophage HK75."
34. **Wolfe, D.** "Assembly of the Glycogenosome: A Two-hybrid experiment."
35. **Wright, A.** "Sequence analysis of Bacteriophage HK239."

36. **Young, M.** "Cloning an RNA interference construct for plant-like cryptochrome in *Chlamydomonas*."
37. **Zhou, Y.** "Gene expression analysis in a murine model of toxoplasmosis."

CCKS:

1. **Brewer, J., G. Cesin, M. Coffelt and M. Firkins.** "Subsurface Investigation of the Technology Way Extension within the Inter-Modal Transportation Business Park. Bowling Green, Kentucky. Company involved: Inter-Modal Transportation Authority, Bowling Green, KY."
2. **Brewer, J., G. Cesin, M. Coffelt, M. Firkins and D. Wood.** "Phase II: Microgravity Subsurface Investigation at the Lot 2H Building Site, within the Inter-Modal Transportation Authority Business Park, Bowling Green, KY."
3. **Cesin, G. M. Coffelt, M. Firkins and D. Wood.** "Phase I: Electrical Resistivity Subsurface Investigation at the Lot 2H Building Site, within the Inter-Modal Transportation Authority Business Park, Bowling Green, KY."
4. **Cesin, G., M. Firkins, N.C. Martin and N. Rinehart.** "Sylacauga, Alabama Dye Trace, Sylacauga, Alabama."
5. **Coffelt, M. and M. Firkins.** "Morris Mill Dam Dye Trace. Company Involved Shannon and Wilson, Inc., St. Louis, MO."
6. **Coffelt, M. and N.C. Marin.** "Greenlick Compressor Dye Trace. Company Involved: URS Corp. Potter County, PA."
7. **Coffelt, M. and N.C. Marin.** "Honey Creek Dye Trace. University Park, Pennsylvania. Company Involved: Penn State Materials Characterization Laboratory."
8. **Coffelt, M., J. Lindsey and N. Rinehart.** "Microgravity Subsurface Investigation of 1720 Media Drive, Bowling Green, KY. Company Involved: The City of Bowling Green, KY."
9. **Coffelt, M., M. Firkins and J. Lindsey.** "Bowling Green Dye Trace. Research for Field Studies class."
10. **Coffelt, M., M. Firkins and J. Lindsey.** "Guam Dye Trace. Anderson Air Force Base, Guam. Company Involved: EA Engineering."
11. **Coffelt, M., M. Firkins and N.C. Marin.** "Lookout Mtn-Chickamauga Dye Trace. Company Involved: NPS, Dept of Interior, Chickamauga, TN."
12. **Coffelt, M., M. Firkins and N.C. Marin.** "Redstone Arsenal Dye Trace. Company Involved: Shaw E & I, Inc., Huntsville, AL."
13. **Coffelt, M., M. Firkins and N.C. Martin.** "Shoal Creek Mine Dye Trace. Company Involved: Drummond Co, Inc., Adger, AL."
14. **Coffelt, M., M. Firkins and N.C. Martin.** "Skyline Dye Trace. Company Involved: Peterson Hydrologic."
15. **Coffelt, M., M. Firkins and N.C. Martin.** "Smith County Landfill Dye Trace. Company Involved: GeoTek Engineering Co, Inc. Smith County, TN."
16. **Coffelt, M., M. Firkins, B Ham and J. Lindsey.** "Tongass National Forest Dye Trace. Alaska. Research for Johanna Kovarik, Graduate Student."
17. **Coffelt, M., M. Firkins, B. Ham, J. Lindsey and N. Rinehart.** "Federal Mogul Dye Trace, Scottsville, KY."
18. **Coffelt, M., M. Firkins, B. Ham, J. Lindsey N.C. Marin and N. Rinehart.** "Pantry-Country Food Mart #20 Dye Trace. Company Involved: SEI Environmental, Inc. Wytheville, VA."
19. **Coffelt, M., M. Firkins, J. Lindsey and N.C. Martin.** "Moss#1 Dye Trace. Company Involved: Geo Environmental Association, Pound, VA."
20. **Coffelt, M., M. Firkins, N.C. Marin and N. Rinehart.** "Bypass Cave Dye Trace. Company Involved: CCKS-WKU, Warren Co, KY."
21. **Coffelt, M., R. Elrod, M. Firkins and N.C. Marin.** "Oak Ridge Dye Trace. Company Involved: SAIC, Oak Ridge, TN."
22. **Coffelt, M., R. Elrod, M. Firkins and N.C. Martin.** "Bear Creek Dam Dye Trace. Company Involved: S&ME, Big Spring Dye Trace. Company Involve: Shippensburg University, Newville, PA."

23. **Coffelt, M., R. Elrod, M. Firkins and N.C. Martin.** "N.A. Water Systems Dye Trace. Company Involved: NA Water Systems Industrial Consulting, PA."
24. **Coffelt, M., R. Elrod, M. Firkins, B. Ham, J. Lindsey, N.C. Martin and D. Wood.** "Rockwell Automation Dye Trace. Company Involved: BBL-Blasland, Bouck & Lee, Russellville, KY."
25. **Elrod, R., M. Firkins and N.C. Marin.** "Big Spring Dye Trace. Company Involve: Shippensburg University, Newville, PA."
26. **Elrod, R., M. Firkins and N.C. Martin.** "Tontitown Dye Trace. Company Involved: Genesis Environmental Consultants, West Virginia DEP Dye Trace. Oak Hill, VA."
27. **Elrod, R., N.C. Martin and N. Rinehart.** "Crump's Cave Dye Trace, Hoffman Institute, WKU, Warren Co. KY."
28. **Firkins, M and N.C. Martin.** "Belize Dye Trace."
29. **Firkins, M.** "Richardsville Dye Trace. Research for Josh Brewer, Undergraduate Student."
30. **Firkins, M.** "Qore Dye Trace. Company Involved: Qore Property Sciences."
31. **Firkins, M. and J. Lindsey.** "Cactoctin Camp Dye Trace. Company Involved: EarthTech, Alexandria, VA."
32. **Firkins, M. and N.C. Martin.** "Headwater, MO Dye Trace, Company Involved: Nick Gironde, Rolla, MO."
33. **Firkins, M. and N.C. Martin.** "Perry County, MO Dye Trace, Company Involved: Missouri Dept of Conservation, Cape Girardeau, MO."
34. **Firkins, M. and N.C. Martin.** "South Plattin Dam Dye Trace, Company Involved: Shannon and Wilson, St. Louis, MO."
35. **Firkins, M. and N.C. Martin.** "Valley Center Dye Trace. Company Involved: GeoSyntec Consultants."
36. **Firkins, M. and N.C. Martin.** "West Virginia DEP Dye Trace. Oak Hill, VA."
37. **Firkins, M., B. Ham, N.C. Martin and N. Rinehart.** "Franklin Landfill Dye Trace."
38. **Firkins, M., J. Lindsey, N.C. Martin and D. Wood.** "Mohawk-Pleasant Hill Dye Trace. Company Involved: The Source Group, CA."
39. **Firkins, M., N.C. Martin and B. Sakofsky.** "Russell Cave Dye Trace, Bridgeport, AL, Graduate Student project, Brian Sakofsky."
40. **Ham, B.** "Mel Taylor Dye Trace. Mel Taylor."
41. **Martin, N.C.** "Lexmark Dye Trace. Company Involved: Tetra Tech-EM, Inc."
42. **Martin, N.C.** "Reed City Dye Trace. Company Involved: Key Environmental, MI."
43. **Martin, N.C.** "St. Louis Airport Dye Trace. Company Involved: URS Corporation, St. Louis, MO."
44. **Martin, N.C., D. Wood and S. Sharp.** "Leitchfield Dye Trace. Company Involved: City of Leitchfield, KY."

CWRS:

1. **Ayers, D.** "Developing a tool to convert old paper documents to xml format." (*Supervised by Dr. Guangming Xing*).
2. **Brown, B., B. Estes, S. Payton and A. Storey.** "Located and mapped existing sanitary sewer lines for the City of Greensburg, KY on a Fee for Service Agreement, in cooperation of the KRWA."
3. **Estes, B. and S. Kramer and A. Storey.** "Conducting the field and lab work for the Bacon Creek Pathogens Study."
4. **Estes, B. and S. Kramer.** "Conduct analyses on natural waters as research for the National Park Service."
5. **Fitzpatrick, D.** "Researched methods for converting old paper documents to xml format using a predefined template." (*Supervised by Dr. Guangming Xing*).
6. **Kumar, A.-T.V.R.** "Researched using a rules based system to evaluate data quality." (*Supervised by Karla Andrew and Dr Mostafa Mostafa*).
7. **Payton, S.** "Mapped existing water lines for Webster Co. Water District in Dixon, KY in January and February, 2006 on a Fee for Service Agreement."

8. **Puttagunta, J.-K.** "Researching methods for converting old paper documents to xml format using a learning algorithm." (*Supervised by Karla Andrew*).
9. **Storey, A.** "Conduct the analyses for U of L's Linking Aquatic Ecosystem Metabolism to the Formation of Drinking Water Contaminants."
10. **Wade, C.** "Develop monitoring strategies of microorganisms in the Oregon Caves National Monument."
11. **Wade, C.** "Development of a DNA method to quantify green algae in the Green River at Mammoth Cave."
12. **Wade, C.** "EPA proficiency tests for Cryptosporidium and Giardia in the WATERS Lab to gain federal certification for these contaminants."
13. **Wade, C.** "Study of the bacterial communities in sensitive aquifers within Mammoth Cave National Park for the National Cave and Karst Research Institute."

ESC:

1. **Addington, N., R. Baker, B. Bibelhauser, M. Burton, J. Campbell, A. Davis, P. Graves, B. Gries, S. Howard, C. Kruckenberg and J. Martin.** "ME Senior Project sequence."
2. **Avdic, D. and E.D. Barcellos.** "Develop electronics for a Robotic Fish for the Innovation and Commercialization center's "Pond" The fish is novel in that it has no battery and is capable of energizing itself from a charged pool." The project team designed the electronics to control the robotic fish. (*Supervised by Dr. Mark Cambron*).
3. **Baldock, D., D. Coomes, B. Hall and J. Tilley.** "Project with deAm-Ron of Owensboro, KY to examine the strength of a seismic connection detail between pre-cast/pre-stress concrete slab and CMU bond beam." (*Supervised by Doug Schmucker*).
4. **Barker, S., B. Ferguson, C. Gay and S. Payton.** "Conduct a structural condition assessment on a structural member from Snell Hall." (*Supervised by Doug Schmucker*).
5. **Bibelhauser, B., R. Farris and M. Seibert.** "Develop process protocols and property databases for new composites." Students are developing manufacturing methods and producing prototypes. (*Supervised by Dr. Chris Byrne*).
6. **Birkhead, J., J. McCombs, S. O'Dell and R. Wimsatt.** "Project with the National Park Services to design, build and test a portable instrumentation lifting system for use in Mammoth Caves." (*Supervised by Ron Rizzo and Dr. Kevin Schmaltz*).
7. **Burton, M., A. Davis and S. Howard.** "Project with Amtech to test the effectiveness of a spark suppression device in their ventilation systems." (*Supervised by Robert Choate and Dr. Kevin Schmaltz*).
8. **Collignon, K.** "Use a non-nuclear soil moisture and density device on moderately plastic clay soils and coarse graded aggregates." (*Supervised by Dr. Matt Dettman*).
9. **Crear, C. and K. Vencill.** "Junior faculty research project to investigate the use of recycled glass as an aggregate in concrete sponsored by Western Kentucky University."
10. **Crear, C. and K. Vencill.** "Research project to investigate the impact of sample size on the strength testing of concrete."
11. **Crear, C., K. Collignon and K. Vencill.** "Create a Mathcad program to do the structural design of footings to be used in commercial buildings in the Bowling Green area." As a result of this program and the partnership with Landmark Engineering, the footing design of three projects have been created. Worked with Landmark Engineering. (*Supervised by Dr. Shane Palmquist*).
12. **Curtsinger, C., D. Moore and S. Obryan.** "Create historic preservation documentation of the College Street Bridge for the Historic American Engineering Record." (*Supervised by Doug Schmucker*).
13. **Dick, K. and H.-C. Pai.** "Research available technology for remote data collecting from residential electric meters for BGMU." The project team did an economic analysis of 4 technologies for remote data collection and gave recommendations. (*Supervised by Dr. Mark Cambron and Dr. Stacy Wilson*)

14. **Elliott, C. and J. Wyatt.** "Design of airplane wing de-icing sensors with Dr Bassey in Physics." The project team designed a sensor capable of measuring the thickness of ice. It is intended to be mounted on the wing of an airplane. The sensor can be used to alert a pilot when a threshold value for the thickness of ice has been exceeded. (*Supervised by Dr. Mark Cambron and Dr. Stacy Wilson*)
15. **Elliott, C. and J. Wyatt.** "Design of airplane wing de-icing sensors with Dr Bassey in Physics." (*Supervised by Dr. Mark Cambron and Dr. Stacy Wilson*)
16. **Feralin, S., S.A. Francis and A. Payne.** "Redesign a chime extender circuit to be part of a future product for DESA Specialty Products." Project team designed and implement circuit design. (*Supervised by Dr. Mark Cambron and Dr. Stacy Wilson*)
17. **Hesson, B., L. Kirby and J. Kondracki.** "Design a means to extract flue gas samples from a power plant stack for analysis via Laser-Induced Breakdown Spectroscopy." This project is an effort between WKU Engineering, Tennessee Tech's Center for Energy Systems Research, and Oak Ridge National Laboratory's Environmental Sciences division. (*Supervised by Dr. Walter Collett*).
18. **Hesson, E.B. and P. Clark.** "Design of Amphibulator Bio-Timer for Nacional de Ciencias Naturales (CSIC), Madrid Spain and the Department of Biology, WKU, Amphibulator Bio-Timer." The purpose of this project is to allow biologist to record sequences of wildlife in the field. The systems uses a microcontroller to sequence recording cycles. The students have been involved in the production of over 40 units that have been deployed. (*Supervised by Dr. Mark Cambron*).
19. **Howard, M., S. Miller and T. Rippy.** "Design of a robot for the Center for Cave and Karst Studies." This robot will move the microgravity equipment and take remote measurements for use in determining cave location. (*Supervised by Dr. Stacy Wilson*).
20. **Ketterman, K. and J.R. Sandusky.** "Project with ARTP Water Resources Lab to design, build and test a portable water filtration and measurement system for use in municipal water treatment plants to measure parasite levels." (*Supervised by Dr. Kevin Schmaltz and Chris Moore*).
21. **Klein, G. and D. Lindsey.** "Design a system to control the pressure in coolant pipe in the Logan Aluminum's finishing mill." Team programmed the PLC, simulated control parameters in Matlab, and recommended a new by-pass valve. (*Supervised by Dr. Mark Cambron and Dr. Stacy Wilson*)
22. **Kondracki, J.** "Project with the National Park Services to design, build and test a laser range finding system for use in Mammoth Caves." (*Supervised by Ron Rizzo and Dr. Kevin Schmaltz*).
23. **Musick, A. and A.J. Thomas.** "Develop a procedure for modeling transformers using the finite element method." This project will be extended to the analysis of a unique transformer concept in collaboration with Buswell Energy in the fall. (*Supervised by Dr. Walter Collett*).
24. **Vencill, K.** "Implementation of the Field CBR Device Project with the following regional engineering firms: DDS Engineering, Van Meter Engineering, Greg Allnutt and Associates, Landmark Engineering, and Holland, Inc." (*Supervised by Dr. Matt Dettman*).

HERI:

1. **Broome, J.** "Continued development of computer programming to study climatic impacts on karst aquifer development for his thesis *Computer Modeling of Karst Aquifer Conduit Evolution*".
2. **Croskrey, A.** "Completed Geographic Information Systems analysis of groundwater contamination sensitivity for a ten county area of south central Kentucky under funding from NPS, USDA, and BRADD."
3. **Despain, J.** "Completed analysis of water flow and chemistry data at Mineral King Valley in Sequoia National Park, California for his MS thesis *Carbon Chemistry of an Alpine Karst Stream Sequoia and Kings Canyon National Parks*."

4. **Edwards, A., B. Hatcher and S. Sharp.** "Sampling, analysis, and Geographic Information Systems for a study of atrazine in water supplies in Rough River Lake under funding from USEPA Region 4."
5. **Fernández, A., B. Hatcher and M. Hendrickson.** "Continued water sampling and analysis and flow measurements to study relationships between agricultural land use and groundwater quality at Cave Spring Caverns, Kentucky under funding from USDA."
6. **Fernández, A., B. Hatcher, M. Hendrickson and P. Kambesis.** "Participated in surveys, inventory and groundwater tracing in Garnett Cave (Adair County) and Munin Cave (Green County) at the request of, and to provide assistance to, The Nature Conservancy."
7. **Hendrickson, M. and J. Kovarik.** "Traveled to Tongass National Forest in southeast Alaska with Groves, in part to finalize research plans for their MS. Thesis research projects."

IASS:

1. **Holcomb, M., M. Kalagotla, K. Littich, S. McMurray, W. Mattingly, J. Maune, C. Poteet, N. Simms, S. Smith, R. Van Fleet and R. Walter.**

KCC:

1. **Baldwin, M., C. Henry and N. Rogers.** "Analysis of flash flooding in Appalachia."
2. **Champlin, D.** "Running MM5 simulation to support flash flooding studies."
3. **Hawkins, A.** "Analysis of stream flow and precipitation data."
4. **Kendrick, D.** "Analysis of ozone concentrations in south central Kentucky."
5. **Lawalin, N.** "Analysis of trends in diurnal temperature range data."
6. **Leeper, R.** "Analysis of dewpoint temperature trends."
7. **Littell, A.** "GeoProfiles Initiative and analysis of natural hazards."
8. **McDowell, S.** "Computer systems administration and programming to support data analysis projects."
9. **Simpson, S.** "Website development and data visualization analysis."

MCC:

1. **Alicie, B., S. Gibson and A. Moore.** "Reaction of Ruthenium Complexes with Histidine," Supervisor: Kevin Williams
2. **Blake, A. and R. Miller.** "Synthesis of Ionic Monolayer-Protected Pd Nanoparticles," Supervisor: Young-Seok Shon.
3. **Burton, K.** "Synthesis and Characterization of a Ruthenium(II) Complex," Supervisor: Kevin Williams.
4. **Chapman, D.** "Reaction of Platinum Complexes with Peptides," Supervisor: Kevin Williams.
5. **Chmely, S.** "Reaction of Platinum Complexes with Selenomethionine," Supervisor: Kevin Williams.
6. **Damin, M.** "Phase Transfer of Ionic Monolayer-Protected Gold Nanoparticles," Supervisor: Young-Seok Shon.
7. **Davies, C.** "Characterization of Compound D with PAHs using Absorption and Emission Spectroscopy," Supervisor: Thandi Buthelezi.
8. **Davis, B.** "Protein Cleavage by Platinum Complexes," Supervisor: Kevin Williams.
9. **Dean, R.** "Admicelle Extraction of Phenols," Supervisor: Eric Conte.
10. **Dougherty, M., A. Ebelhar, J. Fuller, W. Maupin and M. Metzger.** "Impact of Surface Roughness on Acidity Constants of Acid-Thiol Self-Assembled Monolayers," Supervisor: Stuart Burris.
11. **Isaacs, S.** "Molecular Assembly of C₆₀C₇₀-Metal Nanoparticle Hybrid Nanostructures," Supervisor: Young-Seok Shon.
12. **Isaacs, S.** "Chemical and Thermal Stability of Hybrid Nanoparticles and Nanostructures," Supervisor: Young-Seok Shon.
13. **Jones, B.** "Nano Solid Phase Extraction Sorbents," Supervisor: Eric Conte.
14. **Lalonde, K.** "Reaction of pentaammine ruthenium complexes with proteins," Supervisor: Kevin Williams

15. **Lundin, E.** “Dendrimer-Induced Nanoparticle Megamers,” Supervisor: Young-Seok Shon.
16. **Milner, K.** “Characterization of Compound B with PAHs using Absorption and Emission Spectroscopy,” Supervisor: Thandi Buthelezi.
17. **Norris, C., J. Norris, C. Poteet and P. Walden.** “Modular Self-assembly for Gratzel Solar Cells,” Research performed at Oak Ridge National Lab. Supervisor: Tingying Zeng.
18. **Parnley, S.** “Spectroscopic Response of Ionic Monolayer-Protected Gold Nanoparticles,” Supervisor: Young-Seok Shon.
19. **Pharmley, S.** “Ligand Exchange of Ionic Monolayer-Protected Nanoparticles,” Supervisor: Young-Seok Shon.
20. **Pickering, K.** “Admicelle Extraction of Phenols,” Supervisor: Eric Conte.
21. **Small, A.** “Anion Exchange of Tetraoctylammonium-Protected Gold Nanoparticles,” Supervisor: Young-Seok Shon.
22. **White, C.** “Reaction of Ru(bpy)₂Cl₂ with Histidine,” Supervisor: Kevin Williams.
23. **Wright, J.** “Electrochemical Derivatization using SPME,” Supervisor: Eric Conte.
24. **Zhao, Q.** “Surfactant Immobilized Sorbent for Extracint PAHs with Determination by GC and HPLC,” Supervisor: Eric Conte.

□ **Students involved in internships:**

AMSI:

1. **Knight, D.** Roller Die and Forming (Louisville, KY)
2. **Kunz, M.** DESA Int. (Bowling Green, KY)
3. **Lee, L.** AMSI (Bowling Green, KY)
4. **LeMarinel, T.** Allard Architects (Nashville, TN)
5. **Suchanek, R.** Emerson Electric (Russellville, KY)
6. **Taylor, D.** DDI Engineering (Russellville, KY)
7. **Thomas, J.** Emerson Electric (Russellville, KY)
8. **Wieck, R.** AMSI (Bowling Green, KY)

BIOD:

1. **Brotherton, R.G. Clark, J. Constant, J. Kinnis, S. Knifely, D. McCadney, E. Roberts, B. Rogers, M. Skaggs, C. Thomas, A. Turner and A. Wint.**

BIOTECH:

1. **Barahona, N.** KBRIN/INBRE Summer Program.
2. **Krajewski, J.** KBRIN/INBRE Summer Program.
3. **Pendleton, C.** KBRIN/INBRE Summer Program.
4. **Tuck, D.** KBRIN/INBRE Summer Program.
5. **Volz, M.** KBRIN/INBRE Summer Program.
6. **McCadney, D.** Marine Science at Woods Hole Oceanographic Institute
7. **Miles, C.** Mayo Clinic, Scottsdale, AZ.

CWRS:

1. **Kramer, S.** Works in the WATERS Lab, and is a student intern through Mammoth Cave National Park.
2. **Estes, B.** Works in the WATERS Lab, and is a student intern through Mammoth Cave National Park.
3. **Burns, J.** Works as a student intern through the City of Bowling Green.
4. **Raja, A.K.T.** Working as an intern through Spatial Data Integration, Inc.

HERI:

1. **Croskrey, A.** Completed a summer internship for the Division of Science and Resource management, Mammoth Cave National Park.
2. **Hendrickson, M.** Obtained a summer internship with the US Forest Service at Tongass National Forest, Alaska

Appendix G. Advisory Board Recommendations

Recommendations of the Advisory Board of the Western Kentucky University Applied Research and Technology Program

18 May 2006

The following were in attendance: Chris Sinclair, Jim Zandlo, Dave Gottfried, Joe Liles, Doris Moody, Kurt Helf, Paul Dahlhauser, Frank Carchedi, Fred Schultz, & Wayne Wendland

The review committee acknowledges the strength of the ARTP at Western Kentucky University. Not only are the programs sound, but undergraduate students are brought in to the research efforts, working laboratory experiments, analyzing data, writing findings and presenting papers at professional meetings. This system should be maintained and expanded as possible.

As positive as is the above program, it's strengths could be better released to the scientific, technological and general public. The credibility and attractivity of the institution and that of the program will clearly be enhanced by such an endeavor. Again, we recommend that articles and news releases be prepared summarizing each of the separate programs and submitted to (1) professional journals akin to each of the Center's foci, (2) educational journals, (3) magazines and newspapers and (4) radio and TV stations at least in Kentucky. Time spent in such writing is insignificant relative to the value of the potential benefits from those getting out the message.

Each of the Centers should carefully study their program statements available on the web to ensure that a variety of "buzz words" are included within the texts, so that the various search engines will attach the appropriate ARTP programs to inquiries from potential students and users of the various Center's areas of excellence.

The marketing arm of the University should be sought out to also prepare material broadcasting the quality of the ARTP. Those folks know from experience where to go to get the greatest coverage. Also, using the marketing department would incur little cost as opposed to using a private marketing firm.

Some of the Centers are already financially self-sufficient. Although it may be true that not all Centers can attain this quality, all Centers should strive to make their products and services more attractive to potential users to better their financial situation. This will undoubtedly become more important as time continues and funding interests shift.

It may be advantageous to cluster several of the Centers with common foci into a common working group. A clear example is how water and hydrology play significant roles in the Agricultural Research and Education Complex, the Architectural and Manufacturing, Biotechnology Center, the Biodiversity Center, the Center for Cave and Karst Studies, the Center for Water Resource Studies and the Kentucky Climate Center. Let the outside community know that these areas of expertise exist at Western, and

present examples as to how they cooperate in various ways to pursue answers to specific needs and questions. Other such potential commonalities should be investigated and advertised to potential users.

The various Centers have been in operation for several years, producing services, products, analyses and graduates. Showing what the graduates are doing with their training in ARTP will enhance and the attractiveness of the programs to potential college students. Each of the programs should pursue a program to identify how their graduates are using the knowledge, techniques etc. learned in the ARTP. This could be done through email, or a web site (addresses of students available from the alumni office, if not departmental offices). Again, the writing of such an inquiry is minimal compared to the potential results of the survey in terms of advertising the value of the various ARTP programs.

As an example of the inventiveness of the ARTP programs, the Kentucky Climate Center and the meteorology program within the Geography Dept. are sensitive to the fact that the potential employment market for meteorology undergraduate students has severely declined in the last decade or so, primarily since the National Weather Service has essentially stopped hiring BS-level meteorologists due to automated processes which gather and analyze data. To “fit” the Western meteorology program to that market, the staff is preparing a meteorology *certificate* proposal, which would specify a variety of courses in meteorology, geography, geographic information systems and statistics which would prepare students for this emerging market. Other ARTP programs should study the feasibility of taking such “updating” approaches to education programs, i.e., prepare a curriculum which serves the needs of a changing employment market as opposed to the long-time standard college/university major.

An example of such a curriculum is also being developed by the Applied Physics Institute. When offered in the near future, it will be a multi-departmental MS-level course devoted to preparing students in the technical aspects of homeland security. The review committee welcomes the addition of a vice president who will oversee various aspects of the ARTP. One task we would recommend him/her to address is narrowing the lapse between prototype developed at the various Centers and a commercial product. This gap presently limits the likelihood for success for the ARTP.

The review committee congratulates Blaine Ferrell on his continuing leadership for the ARTP. He is a thoughtful leader and a competent motivator and promoter. Because of these qualities, we recommend that he consider touring Kentucky high schools from time-to-time to promote the benefits of the ARTP to potential students at WKU.

Wayne M. Wendland, recorder