The Jess and Mildred Fisher College of Science and Mathematics

Towson University ▪ 8000 York Road ▪ Towson, MD 21252
Phone: 410-704-2121▪ Website: http://www.towson.edu/fcsm

ELECTRONIC NEWSLETTER **April/May 2011**

OFFICE OF THE DEAN

The Fisher College – Inspiring Student Exploration in Science and Mathematics for the 21st Century©

Dear Friends,

The 2010-2011 academic year is now a memory and everyone in the Fisher College has embarked on their summer plans. While some will travel abroad with Towson University students, others are involved in grant-supported activities such as Research Experiences for Undergraduate (REU) projects. Some faculty members are teaching summer classes, and most staff members are busy with tasks like reorganizing classrooms and restocking labs and offices. And the outreach folks in our Towson University Center for STEM Excellence at the Inner Harbor's Columbus Center are booked up with K-12 teacher professional development activities. I always chuckle when a neighbor or non-TU friend asks if we're relaxing now that it's summer. If only they knew…

This past spring has been very eventful, as you will see in this edition of the newsletter. One item to highlight here on page one is that several FCSM faculty members were honored with 2010 Regents Awards. The awardees included Roland Roberts (Biology) and James Saunders (Biology/Chemistry), who were recognized for Mentoring; Jonathan Lazar (Computer and Information Sciences), who received the Public Service award; and Brian Fath (Biology), who was recognized for excellence in Research. Each award carried a $1000 prize.

Finally, here are some photos from the second annual Open House at the Towson University Field Station at alumnus Al Henneman's Camp Running Bear in Monkton, MD, and the 21st Annual Honors Convocation. Have a great summer!

Kids at the Open House use their new magnifying glasses

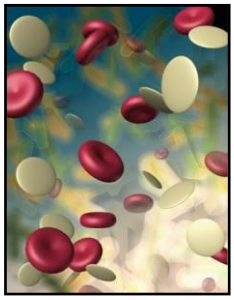
Josh Giltinan and Kaila Hewett gave the student addresses at the Honors Convocation

Sincerely,

David A. Vanko
Dean

Memorial Gifts… from the Development Office

Gifts benefiting The Jess and Mildred Fisher College of Science and Mathematics or any of the departments mentioned in this newsletter**,** may be made to Towson University Foundation in honor of a birthday, anniversary or other special occasion, or simply as a thank you for a special favor. Gift acknowledgements will be sent to the donor as well as the individual being honored. For more information, contact the Towson University Development Office at 410-704-3375 or 1-866-301-3375 or write to the Towson University Foundation, 8000 York Road, Towson, MD 21252-0001.



DEPARTMENT OF BIOLOGICAL SCIENCES

Student Research

Plenderleith, L. and D. Forester. In press. “Lack of Evidence for the Prior Residence Effect in the Allegheny Mountain Dusky Salamander (*Desmognathus ochrophaeus*).” Ethology (in press).

Shields, Vonnie D.C. and Martin, Timothy L. 2011. “The Structure and Function of Taste Organs in Caterpillars.” *In:* Lynch, E.J. and Petrov, A.P. (eds.), The Sense of Taste, Nova Science Publishers, Inc. Hauppauge, NY. Chapter 10, (in press)

Beattie, Katelyn, F., Sanford, J.L., Carter, W. III, Shields, Vonnie D.C., Otálora-Luna, F., and Dickens, J.C. “Visual orientation behavior of gypsy moth larvae to emissive colors.” 2011 Experimental Biology Meeting, Washington, D.C., April 12. The FASEB Journal 25:1046.5. The presentation of this research was funded by an undergraduate travel grant from the FCSM.

Martin, Timothy L. and Shields, Vonnie D.C. 2011. “Taste receptor cells of gypsy moth larvae exhibit varying sensitivities to various phytochemicals.” 2011 Experimental Biology Meeting, Washington, D.C., April 12. The FASEB Journal 25:1048.3.

Sanford, Jillian L., Aginam, N., Khalid, M., and Shields, Vonnie D.C. 2011. “Gustatory habituation to selected alkaloids by gypsy moth larvae.” 2011 Experimental Biology Meeting, Washington, D.C., April 12. The FASEB Journal 25:1046.4. The presentation of this research was funded by an undergraduate travel grant from the FCSM.

Grants and Donations

Matthew Hemm received a grant for $388,619 from the National Institute of Allergy and Infectious Diseases for his work studying the role of small transmembrane proteins in cytochrome bd oxidase activity. Congratulations to Matt for this outstanding achievement!

Brian Fath was awarded a Fulbright Distinguished Chair in Environmental Sciences at the Parthenope University of Naples, Italy for Spring Semester 2012.

Susan Gresens received a fellowship grant ($7,400) from the American-Scandinavian Foundation, to pursue research at the Norwegian University of Science and Technology in Trondheim, during spring and summer of 2011. She is studying the taxonomy and systematics of non-biting midges in the genus *Cricotopus*, using molecular and morphological data from material collected in Europe and North American (including TU!).

Jay Nelson received $8700 in funding for a proposal to the Maryland Sea Grant College entitled: “Factors accounting for intraspecific variance in hypoxia tolerance of juvenile striped bass *(Morone saxitalis).*”

Publications

Beck, H. In press. “Conservation status and range-wide decline of white-lipped peccaries in Latin America: implications for ecosystem function and conservation.” Oryx (in press).

Estes, A.M., A. Belcari, A. Economopoulis, A. Jessup, P. Rempoulakis, and D. Nestel. “A basis for the renewal of Sterile Insect Technique for the olive fly, *Bactrocera oleae* (Rossi)” in press at Journal of Applied Entomology.

Jørgensen SE, Fath BD. 2011. Fundamentals of Ecological Modelling: Applications in environmental management and research, 4th edition. Elsevier.

Evans, M. E. K., Hearn, D. J., Theiss, K. E., Cranston, K., Holsinger, K. E. and Donoghue, M. J. 2011. "Extreme environments select for reproductive assurance: evidence from evening primroses (*Oenothera*)." New Phytologist, 190: no. doi: 10.1111/j.1469-8137.2011.03697.x

Presentations

Brian Fath was invited by the Austrian Ministry of Science and Research to present "Sustainable Development, ecosystems, and resilience" at the Resilience and Adaptation to Climate Change Workshop. Vienna, Austria, 21–22 February 2011.

Sarah Haines conducted a presentation at the Maryland Association for Environmental & Outdoor Education annual conference, held at the University of Maryland. The title was "Maryland's Certified Environmental Educator Program."

Sarah Haines conducted a presentation with Bess Caplan from the Baltimore Ecosystem Study at the National Science Teacher's Association National Conference in San Francisco. The title of the presentation was "Baltimore Partnership for Environmental Science Literacy: Improving Urban Science Teaching & Learning."

Shields, Vonnie D.C., Sanford, Jillian L., Otálora-Luna, F., and Dickens, J.C. 2011. "Emissive color preferences of Colorado potato beetle larvae." 2011 Experimental Biology Meeting. Washington, D.C., April 9-13. The FASEB Journal 25:1046.3. The presentation of this research was funded by a faculty travel grant from the FCSM.

Shields, Vonnie D.C. and Srour Khalid J.M. 2011. "Morphological and neurophysiological characterization of olfactory sensory organs in the house cricket." 2011 Experimental Biology Meeting, Washington, D.C., April 9-13. The FASEB Journal 25:1048.4. The presentation of this research was funded by a faculty travel grant from the FCSM.

Journal and Reviewing Activities

Sarah Haines wrote book reviews for a six-book series of children's trade books titled "Nature's Cycles" for the National Science Teachers Association.

Sarah Haines wrote book reviews for the National Science Teacher's Association for children's trade books titled "Whales & Dolphins" and "Dinosaurs," and a book for nonformal educators titled "Group Inquiry at Science Museum Exhibits."

Jay Nelson reviewed a manuscript entitled "The effect of water pH on the incubation and larviculture of curimbatá *Prochilodus lineatus* (Valenciennes, 1847)" for the Journal Aquaculture.

Jay Nelson reviewed a manuscript entitled "Metabolic and cardiorespiratory responses of summer flounder *Paralichthys dentatus* to hypoxia at two temperatures" for the Journal of Fish Biology.

Jay Nelson reviewed a manuscript entitled: "Swimming Performance Assessment in Fishes" for the Journal of Visualized Experiments.

Vonnie Shields was appointed to the editorial board for the Colonial Academic Alliance Undergraduate Research Journal.

Workshops and Workshop Presentations

Sarah Haines conducted a workshop with Adam Frederick from Maryland Sea Grant and Bob Blake from Elementary Education at the National Science Teachers Association National Conference in San Francisco. The focus of the workshop was using field-based activities to teach environmental science concepts.

Sarah Haines conducted a professional development workshop for outdoor educators at River Valley Ranch in Carroll County. The workshop focused on the use of the Project Learning Tree curriculum published by the American Forest Foundation.

Community Outreach

The TU Biodiversity Center sponsored a workshop titled: "Introduction to Identifying the Common Native Bees in Maryland" that both TU students and interested members of the community attended.

Brian Fath led a group of three Towson students, Caitlin White, Sara Chetelat, and Kim Erickson in a community engagement project, culminating in a tree planting event on Arbor Day (April 30) at Tench Tilghman Elementary School in Baltimore City. Caitlin, Sara, and Kim gave a presentation to two third grade classes on the benefits and lifecycle of trees and helped plant trees on school grounds.

Vonnie Shields served as a judge for the 56th Annual Baltimore Science Fair at Towson University on March 26.

Other Activities

Sarah Haines was appointed to the Maryland State Department of Education's Environmental Literacy Standards and Practices workgroup. The group is charged with writing new environmental education standards to complement the new environmental literacy graduation requirement for Maryland Public Schools.

Vonnie Shields was selected and interviewed by Janet Raloff, Senior Editor of Science News, regarding the research that she and her students presented at the 2011 Experimental Biology Meeting (Washington, D.C., April 9-13). The research focused on the visual orientation behaviors of both Colorado beetle larvae and gypsy moth larvae. Some of this research was carried out as part of Vonnie's recent sabbatical in Dick Dickens' laboratory at the USDA, Beltsville. The link is provided, below, and can be found on the Science News website.
http://www.sciencenews.org/view/generic/id/73186/title/News_in_Brief_Experimental_Biology_2011_conference

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DEPARTMENT OF CHEMISTRY

Publications

Tim Brunker coauthored the following paper with Arnold Rheingold and recent TU graduate Ben Roembke:

Brunker, T. J.; Roembke, B. T.;* Golen, J. A.; Rheingold, A. L., "Synthesis and structures of 1',2',3',4',5'-pentamethylazaferrocene complexes with Lewis acidic boranes." Organometallics 2011, 30 (8), 2272-2277.

Sonali Raje coauthored the following paper in the March 30 edition of the online journal PLoS:

Kodali, V.K., Gannon, S. A., Paramasivam, S., Raje, S., Polenova, T. and Thorpe, C. "A novel protein rich disulfide membrane from avian eggshell membranes."

Sonali Raje authored an editorial accepted by the Journal of College Science Teaching (*in press*).

Research Presentations

Two of Tim Brunker's current undergraduate research students, Samantha Wood and Brianne Bentivegna, and a former research student (recent TU graduate Krista Taylor) presented their results at the 25th National Conference on Undergraduate Research in Ithaca, NY:

Wood, S. E.*, Taylor K. N.*, Brunker, T. J. 2011. "Synthesis and Studies of Ru(II) Complexes of Chiral Tetradentate Amino-Sulfoxide Ligands."

Bentivegna, B.,* Brunker T. J. 2011. "Studies of the Reactivity of Azaferrocene-Borane and Synthesis of a Bis(Azaferrocene) Boronium Salt."

Chemistry undergraduate and Environmental Science graduate students mentored by David Ownby, Ryan Casey, and Steve Lev (PAGS) presented research posters at the Chesapeake-Potomac/Hudson-Delaware regional Society of Environmental Toxicology and Chemistry meeting in Wilmington, DE:

"Developing a copper isotope ratio method for estimating copper availability to *Eisenia fetida*." M.C. Mazzei*, S.M. Lev, D.R. Ownby. (1st place Undergraduate Poster)

"Kinetics of Zn accumulation in the isopod *Porcellio scaber* exposed to contaminated diet." K. Marsh*, R.E. Casey. (2nd place Undergraduate Poster)

"Zinc toxicity and transport in barley." J.J. New*, J.W. Snodgrass, D.R. Ownby, R.E. Casey, S.M. Lev. (3rd place Undergraduate Poster)

"Water quality monitoring for the effects of road salt and suspended sediment on Yellow Perch (*Perca flavescens*) in three tributaries of the Chesapeake Bay." A. Whiting*, A.E. Pinkney*, R.E. Casey, D.R. Ownby.

"Impacts of zinc dietary exposure to *Lumbricus terrestris*." K.E. Linford**, R.E. Casey.

Melissa Willen, an undergraduate student mentored by Shannon Stitzel, presented her results at the Colonial Academic Alliance Undergraduate Research Conference:

"Investigation of Molecularly Imprinted Polymers with Metal Cations." Willen, M.* and Stitzel, S.E.

Professional and Community Service

Sonali Raje, a member of the national American Chemical Society Exams Committee, General Chemistry Group, attended a committee meeting for development of assessments in Anaheim, CA.

Shirish Shah participated in training of high school students for the International Chemistry Olympics.

Department Seminars

The following seminars were given by candidates for the position of Assistant Professor of Analytical Chemistry:

Jinwoo Park, University of North Carolina, "Application of Electrochemical Techniques for the *In Vivo* Measurement of Catecholamines in the Rat," April 14.

Jared DeCoste, Edgewood Chemical and Biological Center, Aberdeen Proving Ground, "Porous solid materials for the reactive removal of toxic industrial chemicals and chemical warfare agents and their stimulants," April 19.

Anthony Kennedy, East Carolina University, "Infrared Spectroscopy Applied to Conservation and Archaeology" April 21.

William LaCourse, University of Maryland, Baltimore County, presented a seminar on "Discovery Learning: Introductory Chemistry Courses, April 7.

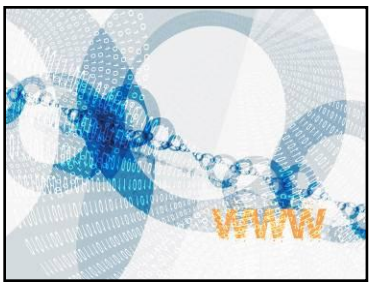
The Summer 2010 Raspet Research Fellowship and Linda Sweeting Undergraduate Research Fellowship Awardees presented research seminars on April 15:

Gordon Crews (faculty mentor: Ana-Maria Soto), "Effects of Variable Stem Lengths on the Stability of RNA Bulges and Loops."

Carlo Mercado (faculty mentor: Cindy Zeller), "Investigation of Multiple Genes for the Identification of Sperm."

Travis Poulsen (faculty mentor: David Hearn), "Evolutionary Analysis of Brassica."

Brittany Davis (faculty mentor: Ana-Maria Soto) gave a seminar on "Understanding the Disease of Tuberculosis" as part of her Honors College capstone project on May 6.



DEPARTMENT OF COMPUTER AND INFORMATION SCIENCES

Publications and Presentations

Jonathan Lazar published a paper titled “Public Policy and Human Computer Interaction in the United States Context” in ACM Interactions.

Jonathan Lazar, recent doctoral graduate Brian Wentz, and a team of 18 undergraduate researchers from Towson University presented a research paper titled “Societal Inclusion: Evaluating the Accessibility of Job Placement and Travel Web Sites” at the INCLUDE 2011 conference on April 21 in London.

Jonathan Lazar gave multiple presentations about web accessibility at:

-Keynote speech at the Iowa State University Emerging Technologies Conference, April 25, 2011.
-University System of Maryland Academic Affairs Advisory Council on April 8, 2011.
-Computer Science Lecture Series of the Florida Institute of Technology, March 25, 2011.
-Space Coast Human Factors and Ergonomics (HFES) Group, March 24, 2011.
-Provost’s Disability Advisory Committee at the University of Delaware on March 21, 2011.

Chao Lu and his doctoral student Yinan Yang, along with colleagues X. Wang and J. Li from University of Texas-Pan American presented a paper at the SPIE 2011 Radar Sensor Technology Conference “Comparison of Three Radars for Through-the-Wall Sensing,” April 25-27, in Atlanta.

Kathy Wang, Alfreda Dudley, Giovanni Vincenti and James Braman had the paper “Augmented Reality for the Classroom: Enhancing Concepts for Computing Courses” accepted to the May 2011 Interdisciplinary Conference of the Association of History, Literature, Science and Technology in Houston, Texas.

Erastus Karanja had a manuscript entitled “An Empirical Investigation of the Relationship between Firm Information Technology Investments and Innovation” accepted for publication in the 17th Americas Conference on Information Systems.

Suranjan Chakraborty’s paper with Raza Hasan (doctoral student) titled “Investigating Software Maintenance Challenges in Small Organizations” was accepted for the 17th Americas Conference on Information Systems, Detroit, Michigan - Aug 4– 7.

Suranjan Chakraborty was invited and gave a guest talk titled “An exploration into the Requirements Elicitation Process: A Grounded Theoretical Approach” at the Chair of Information Systems Engineering, Goethe University, Germany on March 24.

Services to the Discipline

Blair Taylor has been invited to participate in the 2011 ITiCSE Working Group on Information Assurance Education in Two- and Four-Year Institutions taking place in Darmstdadt, Germany on June 24-29.

Chuck Dierbach was an invited speaker at New York City College of Technology (“City Tech”). He gave a presentation on “Piloting Pathways for Computational Thinking in a General Education Curriculum” in January. He serves as a consultant for a project at City Tech on computational thinking.

Wei Yu served as the guest editor of EURASIP JWCN special issue on quality of service (QoS) in wireless networks and the program committee of the IEEE International Conference for Military Communications (MILCOM) 2011, the 2011 Colloquium for Information Systems Security Education (CISSE), the International Conference on Advances in Computing and Communications (ACC). He also reviewed papers submitted to IEEE Transactions on Computers (TC), IEEE Transactions on Parallel and Distributed Systems (TPDS), IEEE Globe Communication (Globecom) 2011, IEEE International Conference on Communication (ICC) and Sixth International Workshop on Systematic Approaches to Digital Forensic Engineering (SADFE) 2011.

Gabriele Meiselwitz has been invited to serve as a technical reviewer for the forthcoming Programming the World Wide Web, 7th edition, by Robert Sebesta, Addison-Wesley/Prentice Hall Publishing.

Grant & Awards

Chuck Dierbach was one of seventeen faculty members nationwide to be awarded an NSF-funded travel scholarship to be a participant in a workshop titled "Innovative Approaches to Introducing Computer Science." The results of this workshop are to be published. The workshop was held in early March in New Orleans.

Announcements

Jonathan Lazar was interviewed about Web Accessibility, on the Kojo Nnamdi show on National Public Radio, March 29.

There was a news story on campustechnology.com on March 23, 2011 titled "Towson U Tackles Audio CAPTCHA" about the research project being done by Jonathan Lazar and Heidi Feng.

DEPARTMENT OF MATHEMATICS

Papers Published or Accepted for Publication

Sergiy Borodachov's paper "Construction of Optimal Cubature Formulas Related to Computer Tomography" (joint with V.F. Babenko and D.S. Skorokhodov) will appear in Constructive Approximation, Volume 33, Number 3 (2011), pp. 313-330.

Linda Cooper and Ming Tomayko's paper "Understanding Place Value" was published in the May issue of Teaching Children Mathematics published by the National Council of Teachers of Mathematics.

Alexei Kolesnikov's paper "Amalgamation functors and boundary properties in simple theories" (joint with J. Goodrick and B. Kim) was accepted for publication in Israel Journal of Mathematics.

Jay Zimmerman's paper "Minimal Extension Covers" was published in Communications in Algebra, 39, No. 4 (2011), 1250 - 1259.

Presentations

Alexei Kolesnikov was an invited panelist on the "Modeling Risk and Disruptions on Transportation Networks" panel at the Fifth Annual DHS University Network Summit, held on April 1 in Washington, DC.

Alexei Kolesnikov gave a talk "Generalized amalgamation and homology in model theory" at the George Washington University Logic Seminar.

Undergraduate Research

The white paper "Risk Analysis: Toxic Materials Transportation Security" will appear in the Journal of Homeland Security. The paper describes the work of this year's Applied Mathematics Laboratory team of D. Howell, P. O'Neill, and M. Tiger, under the direction of Drs. A. Kolesnikov and A. Kumchev.

Workshops

Gail Kaplan and Michael Krach presented a workshop using fun, interesting problems to motivate students to use critical thinking skills as they solved mathematical challenges. The students, seniors from Dundalk High School, were visiting the Towson University campus as part of a Gear Up grant.

Dr. Michael Mihalik, of the Mathematics Department at Vanderbilt University and Dr.Tatyana Sorokina, Towson University, presented a half-day workshop on the Moore Method. The workshop took place on April 1 at Towson University, and was part of a grant from the Educational Advancement Foundation.

Refereeing, Reviewing and Panel Service

Gail Kaplan reviewed an article for the NCTM journal, Mathematics Teacher.

Community Outreach

Judy Macks and Maureen Yarnevich continues to spend either Wednesdays or Fridays at either Cherry Hill Elementary/Middle School or Patapsco Elementary Middle/School, teaching mathematics lessons to students as well as working with teachers on their lesson plans.

Maureen Yarnevich continues to spend Tuesday and Thursday mornings working with first grade teachers and students at Resurrection St. Paul School in Ellicott City.

Miscellaneous Professional Activities

On Thursday, April 21 Honi Bamberger represented Towson University at a meeting of faculty for higher education, sponsored by the Maryland State Department of Education. This meeting, held at the USM Office in Adelphi, Maryland had faculty from institutions across the state reading, editing, and revising the newly written Maryland State Standards; which have been rewritten to align with the Common Core State Standards. Dr. Bamberger revised the third-grade standards.

On Monday, April 11 Honi Bamberger spent the day with five mathematics coaches from Newark, New Jersey to help them create a weekend institute for elementary teachers. This work will be completed on May 16. The institute will be held in early June.

Gail Kaplan attended her first meeting as a member of the College Board Middle States Regional Advisory Council for two days in Philadelphia.

Mathematics Department Colloquia, Seminars and Talks

On March 31, Dr. Michael Mihalik, Professor of Mathematics at Vanderbilt University, presented a colloquium lecture entitled “Commensurators and quasi-normal subgroups of groups.”

On April 15, Dr. Sung-Eun Kim, leader of the Computational Fluid Dynamics R&D group at the Carderock Division of the Naval Surface Warfare Center, presented a colloquium lecture “Mathematical modeling of hydrodynamics observed around boats.”

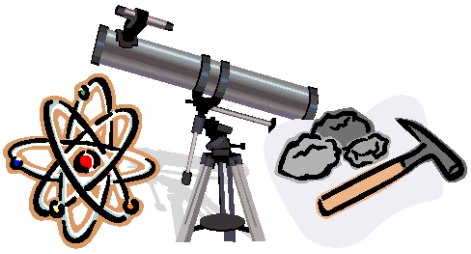
On April 22, Dr. Simon Foucart, Assistant Professor of Mathematics at Drexel University, presented a colloquium lecture entitled “Compressive sensing and the hard thresholding pursuit algorithm.”

On April 28, Dr. Padmanabhan Seshaiyer, Associate Professor of Mathematics at George Mason University, presented a colloquium lecture “Undergraduate research, education and training in computational mathematics and nonlinear dynamics of biological, bio-inspired and engineering systems.”

Student Clubs

Honi Bamberger, faculty advisor of the Mathematics Education Club, invited Ms. Kimberly Burton-Regulski, Mathematics/Information Technology Department Chair at Eastern Technical High School, in Baltimore County to be the April 25 speaker. Ms. Burton-Regulski spoke with members about “Using Wiki in a 21st Century Classroom.”

Members of the Mathematics Education Club and students in mathematics methods classes hosted a Family Math Event at The Tunbridge Charter School in Baltimore City on Tuesday, April 12. Dr. Bamberger, who is a member of the school's advisory board organized this event and 20 undergraduates created mathematics activities for families to participate in. The event was a huge success, as demonstrated by the number of parents and children attending.



DEPARTMENT OF PHYSICS, ASTRONOMY & GEOSCIENCES

The Physics group inducted five new members into the Sigma Pi Sigma Honors Society on Friday, April 29. New inductees were Dr. Matthew Abrams, Ms. Brittany Bonsall, Mr. Gilles Dongmo-Momo, Ms. Parul Srivastava, and Mr. Ekembu Kevin Tanyi.

Sigma Pi Sigma Members (new and past members) at the 2011 Induction Ceremony

Congratulations to the Society of Physics Students (SPS), who came in First place at the 1st Annual STEM Olympiad.

Publications

"Epitaxial Integration of Photoresponsive $Bi_{0.4}Ca_{0.6}MnO_3$ with Si(001)" G. J. Yong, Rajeswari M. Kolagani, B. Hofmann, S. Adhikari, Y. Liang, and V. Smolyaninova, J. Appl. Phys. **109** 063913 (2011)

Ron Hermann's manuscript "Breaking the Cycle of Continued Evolution Education Controversy: On the Need to Strengthen Elementary Level Teaching of Evolution" has been accepted for publication in the journal Evolution, Education and Outreach and is available online at http://www.springerlink.com/content/83655q7398652hqw/fulltext.pdf.

Miranda, R.J. (Under Review). "Urban high school teachers' beliefs of essential science teaching dispositions." Science Educator.

Presentations and Abstracts

Cody Sandifer gave a presentation entitled "Pairing science inquiry lessons with active reading activities: Striving for engagement, interaction, and increase learning across the curriculum." Workshop presented at the meeting of the National Science Teachers Association, San Francisco, March 2011.

Cody Sandifer and James Selway participated in a webinar on the recruitment and mentoring of secondary physics majors.

Rommel Miranda presented his research paper entitled, “The influence of teacher-scientist partnerships on urban middle school students’ science learner characteristics,” at the 2011 National Association for Research in Science Teaching Conference in Orlando, Florida.

Vera Smolyaninova made a presentation at the March Meeting of the American Physical Society at Dallas, TX entitled “Large photoinduced conductivity reduction in thin films of metallic ferromagnetic manganites,” by V. N. Smolyaninova, G. Yong, Rajeswari M. Kolagani, Amlan Biswas, and K. Wang (K. Wang is an undergraduate co-author).

Vera Smolyaninova made a presentation at the CLEO 2011, Baltimore, MD, entitled “Maxwell Fisheye and Eaton Lenses Emulated by Microdroplets,” by V.N. Smolyaninova, I. I. Smolyaninov, A.V. Kildishev, and V. M. Shalaev.

Community Engagement and Professional Service

Cody Sandifer taught a half-day workshop on “The Science of Science” at Cromwell Valley Park for the Maryland Master Naturalist Program. This program is sponsored by the University of Maryland Extension.

Last month’s planetarium show on “Misconceptions and the Forgotten” was given by Brian Eney, to a full house of attendees.

Alex Storrs participated in a YouTube video for the Student Ambassadors, http://www.youtube.com/watch?v=Hvoi7PrsAy8

In April, Dr. Rommel Miranda facilitated portable planetarium shows to 225 students (Grades 3-8) at Garrett Heights ES/MS (Baltimore City), Glenmount ES/MS (Baltimore City), and the Boy Scouts of America Regional Meeting (Baltimore County).

Rommel Miranda was invited by the Maryland Science Center to facilitate a session entitled, “Science Centers and Teachers Working Together,” at the 2011 National Meeting of Science Centers.

Rommel Miranda was invited by the Astronomical Society of the Pacific (ASP) to serve on the Local Organizing Committee for 2011 ASP Meeting to be held in Maryland on August 1-3.

Vera Smolyaninova served on the NSF panel.

David Schaefer gave four presentations to approximately 75 elementary school students at Camp Puh’tok on April 12.

ENVIRONMENTAL SCIENCE AND STUDIES PROGRAM

The Third Annual Environmental Conference at Towson University was held on April 18 and attended by over 300 members of the TU community. This year’s conference contained a series of firsts: more presentations than ever [17 distinct workshops/presentations] along with two keynote speakers; more independent student presentations, i.e., students presenting on a topic of personal interest; more student class presentations, i.e., presentation developed from a class assignment; more presentations about food including three by local farmers. The event ended with a delicious ice cream social!

MOLECULAR BIOLOGY, BIOCHEMISTRY BIOINFORMATICS (MB3) PROGRAM

On April 9, MB3 students participated in the “Relay for Life” event on campus. Over 20 students raised money for cancer research by running in relay fashion for 12 hours!

On April 15, two MB3 students presented their work at the MB3 seminar series. Shannon Kelly presented her work on “The Tumor Suppressive Role of the miR-23a Cluster on 14-3-3 Proteins in Acute Leukemia” and Divya Nayyar presented her work entitled “Synthesis of motualevic acid analogues, a new structural class of antibiotics against drug resistant bacteria.”

On April 22, the MB3 club spring seminar series continued. Natatlie Ceaicovscaia presented her work entitled “The Continuation of the *Chrysothamnus* Saga: Monophyly and position within Astereae?” She conducted her work with Dr. Roland Roberts of Biology.

After the seminar on April 22, the Towson University Marketing Department filmed a music video featuring the MB3 students. Marketing wrote an original song for the event and featured the MB3 club because it is one of the most active clubs on campus.

On April 23, the MB3 club went on a special field trip to visit the research laboratories at Ft. Detrick. The visit included tours of BL-3 level labs where pathogens are worked with in a clean room environment.

On May 6, the finale of the MB3 club seminar series was presented by Jessica Canter. Jessica presented her work on “*Mycoplasma gallisepticum* Infection in House Finches” which she conducted with Dr. Meghan May in Biology.

CENTER FOR SCIENCE AND MATHEMATICS EDUCATION

On April 30, the CSME hosted 16 middle and high school teachers at the TU Field Station for a wetlands workshop. Vanessa Beauchamp was our guest scientist. Teachers learned proper wetland delineation techniques as they explored the wetland areas at the Field Station. Teacher participants were part of the CSME’s NSF Project “Culturally Relevant Ecology, Learning Progressions, and Environmental Literacy.”

HACKERMAN ACADEMY OF MATHEMATICS AND SCIENCE

On April 29 the Hackerman Academy made a special visit to the Towson University Child Care Center where Dr. Don Thomas made numerous classroom visits and a did a presentation for some of our youngest students as part of their Parents Day program.

Saturday Morning Science at Towson University

The Hackerman Academy's Saturday Morning Science continued its spring series on March 19 with Mr. Joe Domanico from the Aberdeen Proving Ground presenting "The Science Behind Fireworks." On April 30 Dr. Don Thomas presented a program on "The First Humans in Space" to conclude the Spring 2011 series. Total attendance for the eight spring programs was 3,400.

Hands-On Science

Following each of the programs this spring, ***Hands-On Science*** activities were held for 25 elementary and middle school students. These hour-long activities allowed the students to explore topics in more detail with themes related to each of the programs at Saturday Morning Science. On March 19 students investigated a series of chemical reactions and on April 30 they explored the planet Earth. *Hands-On Science* was led by volunteer Mr. Ray Miller from the Aberdeen Proving Ground.

Saturday Morning Science at Southside Academy

The Hackerman Academy continued development of Saturday Morning Science at Southside Academy on March 26 with a program titled "Wildlife on the Edge" by Valerie Garcia, a former early childhood education student at Towson University who now runs Wildlife Adventures. During the program students and family members from the Cherry Hill neighborhood learned about animal habitats and what can be done to protect threatened and endangered species. Following the presentation, hands-on sessions were conducted where the students were able to meet the animals up close and personal. Total attendance for the two programs this spring was nearly 100.

Outreach Activities

The Hackerman Academy visited the following schools, institutions, and community groups and made presentations on career planning, the Space Shuttle, and science in space reaching over 4,000 students, teachers, family members, seniors, and community leaders. School visits covered Baltimore City and Baltimore, Howard, Carroll, Charles, Anne Arundel, and Prince George's counties which illustrates the breadth of the outreach being done by the Hackerman Academy. The students addressed covered the age range of 2-80 in these programs and outreach activities.

School Visits :

3/16 Three presentations on living and working in space to 70 fifth grade students visiting Towson University from Woodbridge Elementary School (Baltimore County) in cooperation with the Professional Development School program in the College of Education

3/18 Invited keynote address on career planning and achieving your dream to 400 students in grades 9-12 at Century High School (Carroll County)

3/23 Presentation on career planning and living and working in space to 285 eighth graders at Hereford Middle School (Baltimore County)

3/29 Two presentations on career planning and achieving your dream to 500 ninth grade students at North Point High School (Charles County)

3/31 Three presentations on living and working in space and the importance of STEM to 150 students and family members at Waverly Elementary School (Howard County) in cooperation with the Professional Development School intern program in the College of Education at Towson University

4/1 Presentation on spacesuit technology to 250 sixth graders at Fallston Middle School (Harford County)

4/4 Three presentations on career planning and achieving your dream to 250 students in grades 9-12 at River Hill High School (Howard County)

4/11 Presentation on the importance of STEM education to 125 students and family members at Randallstown Elementary School (Baltimore County) for their STEM Night program

4/12 Two presentations on career planning and achieving your dream to 500 students in grades 9-12 at Dulaney High School (Baltimore County)

4/14 Presentation on career planning and achieving your dream to 81 students in grades 11 and 12 at Dundalk High School in cooperation with the Project Gear Up program at Towson University

4/15 Four presentations on living and working in space to 100 students in grades 3-5 at Highland Park Elementary School (Prince George's County) as part of their STEM Career Day program

Two presentations on living and working in space to 125 students in grades 6-8 at Glenmount Elementary/Middle School (Baltimore City)

4/27 Presentation on living and working in space to 100 pre-K and kindergarten students at Marley Elementary School (Anne Arundel County)

4/29 Presentation on living in space to 100 pre-K students and their parents at the Towson University Child Care Center in cooperation with early childhood development students from Towson University during the Center's Parent Day program

5/1 Presentation on career planning and achieving your dream to 45 high school students at McDonnough High School (Charles County)

5/9 Luncheon presentation for ten science fair winning students in grades 3-5 at Pleasant Plains Elementary School (Baltimore County)

5/10 Five presentations on the engineering and astronaut professions to 125 students in grades 7-8 at Moravia Park Middle School (Baltimore City) as part of their annual Career Day program

Additional Community Outreach:

3/17, 3/24, 3/31 "The Space Shuttle Program: Disasters and Accomplishments" a 4-week course taught for 50 seniors at the Osher Institute of Lifelong Learning at Towson University. A guided excursion to the National Air & Space Museum was also led by Dr. Don Thomas on April 5.

3/27 Dr. Don Thomas emceed the Baltimore Science Fair Awards Ceremony that was attended by 200 students and family members at Towson University.

5/5 Presentation on “Flying Aboard Space Shuttle Discovery” to 600 students and family members at the United States Air Force Museum in Dayton, Ohio, as part of their Space Day celebration

Advisory Board Participation:

3/16 Scientific Council of the Maryland Science Center

4/28 Regional STEM Center Advisory Board, Anne Arundel Community College

Hackerman Academy in the News

4/25 “Blasting Off With Saturday Science” online article at TowsonPatch.com about the Hackerman Academy’s Saturday Morning Science program

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SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) TEACHING COMMUNITY PROJECT

Project Description

The goals of the Science, Technology, Engineering, and Mathematics Teaching Community (STEM-TC) project are to: (1) improve STEM courses in the College, (2) recruit and retain secondary STEM teachers, and (3) establish an expanded teaching and learning community that includes STEM faculty and undergraduate STEM majors.

A key aspect of STEM-TC is the implementation of an undergraduate Learning Assistant (LA) program, in which undergraduate STEM majors are hired to assist faculty in implementing active learning teaching strategies in large lectures, small lectures, laboratory classrooms, and various out-of-class contexts. All project activities are driven by these faculty-led working teams, which consist of a STEM faculty member and 1-3 undergraduate LAs.

Projected outcomes of Towson’s STEM-TC project include course improvements in all Fisher College of Science and Mathematics (FCSM) departments, student learning and attitude gains, increased retention and recruitment of STEM majors, and the increased recruitment of STEM majors into the secondary teaching program.

Project Personnel

Seven faculty and nine learning assistants are currently involved in the STEM-TC project. Dr. Sonali Raje has rejoined the project, Dr. Alex Storrs is a new STEM-TC faculty fellow, and four new undergraduate learning assistants have joined (Ying Li, Gene Shanholtz, Eddie Strobach, Zachary Steelman).

STEM-TC Faculty.

Department of Chemistry: Sonali Raje

Department of Mathematics: Gail Kaplan

Department of Physics, Astronomy & Geosciences: Phuoc Ha, James Overduin, Cody Sandifer (Project Director), Jeff Simpson, Alex Storrs

Undergraduate Learning Assistants (LAs).

Department of Chemitry: Ying Li

Department of Mathematics: Sarah Kutzberger

Department of Physics, Astronomy & Geosciences: Stephanie Gonzalez, Gene Shanholtz, Joshua Tyler, Eddie Strobach, Gilles Dongmo-Momo, Brittany Bonsall, and Zachary Steelman

STEM-TC Project: Spring 2011 Activities

Activities from different project faculty and students are highlighted each newsletter. Here, learning assistants describe their STEM-TC teaching duties and one thing that they learned about effective science teaching this semester.

Mathematics.

Sarah Kutzberger: As a ULA for the Honors Seminar in Mathematics, I was able to enhance students' understanding of abstract mathematical concepts through hands-on activities that I either planned or assisted with in the classroom. Additionally, by holding office hours outside of class, I was able to give students a peer resource to assist them with difficult material. One thing that I learned about effective teaching in the STEM disciplines by being a ULA, is that students learn in different ways and that all students should be given the opportunity to learn in a way that suits them.

Physics, Astronomy & Geosciences.

Eugene Shanholtz: My teaching duties for the Spring 2011 semester included hosting several hours of tutoring outside of class every week and assisting in lab operations. In this time I have tried to help many students link lecture and lab together in order to develop a better understanding of the physical mechanisms of nature. Specifically from the learning assistant seminar I have learned certain teaching styles that may be mixed together in order to engage students' own individual thoughts while not overloading difficult concepts upon them.

Zachary Steelman: My duty for STEM-TC was to hold tutoring session to help students with any questions they had about the material from that week. I also was responsible for helping Dr. Ha in class/lab exercises that he felt required extra assistance. Throughout my experience the main thing that I learned was how to be a better teacher by creating dialogue instead of just lecturing. It was found that students would understand material much better if they came upon the answers themselves instead of me just showing them how to do the given exercise.

Edward Strobach: Outside of class, I tutored those that needed help with Astronomy. In class we went over lecture tutorials that promoted different ways of thinking. My job was to guide those in the right direction that didn't understand a particular question. What I learned: I encouraged all students to think, but had to work with students that just "wanted the answers" more. I think they appreciated it in a sense that they were forced to use their mind differently. I wasn't able to make it as interesting for them, but they were able to understand the material better. I would use elliptical type questions: a student might ask how the distance between the sun and earth is related to the orbital period, and I would reciprocate by asking them about Kepler's third law. I would encourage deeper thinking, and try to make them reflect on what they may have learned.

BALTIMORE EXCELLENCE IN STEM TEACHING PROJECT (BEST)

The Baltimore Excellence in STEM Teaching Project – "BEST" will hold its 2011 Program Orientation and Kickoff Meeting on Saturday, May 14 at the TU Center for STEM Excellence, located at the Columbus Center. Twenty-four secondary-level public school STEM teachers from Baltimore City, Baltimore County, and neighboring school systems were selected for the 2011-2012 BEST Project from a pool of 49 applicants. At the Orientation Meeting, BEST Teachers will review program goals and expectations, become acquainted with their fellow BEST participants, and engage in inquiry-based activities to model effective instructional techniques.

Each BEST Teacher has been matched with a mentor at a local research institution where they will be immersed in a six-week authentic research experience. BEST Teachers will be active members of a research team and gain first-hand experience in how STEM knowledge is generated. Their hands-on exposure to cutting-edge technology, enriched STEM

content, and “real-world” research will serve as the foundation for translating summer research experiences into inquiry-based, meaningful lessons for their students during the 2011-2012 academic year.

Thank you to the following FCSM faculty who are sponsoring BEST Teachers during their summer research experience and mentoring them during the 2011-2012 academic year: Vanessa Beauchamp, Raj Kolagani, Barry Margulies, Jay Nelson, Lev Rhyzkov, Tatyana Sorokina, and Grace Yong.

BIOSCIENCE EDUCATION AND OUTREACH PROGRAM

Towson University's Center for STEM Excellence provides outreach programs to Maryland's K–12 schools. The Education and Outreach Program team within the Center for STEM Excellence is committed to engaging, exciting and educating Maryland’s middle and high school students in science. To that end, we deliver a variety of programs independently and in collaboration with faculty, educators, government agencies and industry partners. Two of our most long-standing and well known programs are the SciTech student learning lab, a program housed within the Columbus Center in Baltimore’s Inner Harbor and the Maryland Loaner Lab program.

SciTech Reaches Out to National and International Student Groups

SciTech played host in April to a group of enthusiastic middle school students from The Sonshine Christian Academy in Ohio. Their teacher, Dr. Patricia Black-Clay, attended SciTech’s short course “Bioscience Bootcamp” during the National Science Teacher Association Convention in November, 2010. Dr. Black-Clay was so excited by the opportunities offered through our SciTech program she arranged for her students to visit our facility during their Spring Break. She and her students came on two consecutive days and conducted lab activities on sickle cell anemia and lactose intolerance.

Later the same month, approximately 20 high school students from Japan came to visit SciTech in conjunction with a program from Osaka Kyoiku University. As part of their week-long trip to the United States, the group toured the Columbus Center facility, including UMBC’s Aquaculture Research Center, and conducted a laboratory activity involving DNA extraction in the SciTech lab. We would like to extend a special thanks to UMBC’s Dr. Keiko Saito for helping with translation and leading the tour of the Aquatic Research Center. Everyone had a fun and educational time. As one of the students put it, “To collect my own DNA fascinated me!”

PhysTEC – PHYSICS TEACHER EDUCATION COALITION

Project Description

The Physics Teacher Education Coalition (PhysTEC) project is a nationwide project that has the mission of improving and promoting the education of future physics teachers. At each of the PhysTEC sites around the United States, physics faculty, education faculty, and a full-time teacher-in-residence (TIR) work together to improve secondary physics education programs.

Towson University¹s current PhysTEC project will run from 2010-2013. The project team consists of Dr. Ronald Hermann and Dr. Cody Sandifer, two full-time science education faculty in the Department of Physics, Astronomy & Geosciences

(PAGS), and a full-time TIR. The 2010-2011 TIR is James (Jim) Selway, a former Baltimore County physics teacher of 30+ years.

At Towson, the PhysTEC project team is making a concerted effort to expose physics majors early in their academic career to (a) the possibility of teaching as a career and (b) actual teaching experiences at both the K-12 and university levels. This is being done through general advertising (posters, open meetings, classroom visits), school- and outreach-based early teaching courses (SCIE 170), and the STEM-TC learning assistant program.

Other efforts are geared towards helping our education majors develop a greater sense of belonging to an educational community. These efforts include the creation of a comprehensive physics education web site, the establishment of a new secondary STEM education club, formal and informal discussions with the physics TIR, and the funding of small grants that allow education majors to attend and present at NSTA and AAPT meetings.

Please visit the national and local web sites for more information about PhysTEC:

National: http://www.phystec.org Local: http://www.towson.edu/fcsm/community_engagement/PhysTEC/index.asp

PhysTEC Project: Spring 2011 Activities

Different activities from Towson's PhysTEC project are highlighted each newsletter. The following activities are from March – April 2011.

- *Teachers Advisory Group* – In order to promote communication and collaboration between Towson University and the Physics teachers of the surrounding local educational systems, we have formed a TAG group consisting of Dr. Cody Sandifer, Dr. Ron Hermann, Mr. Jim Selway, Mr. Steve Shaw from Baltimore County, Mr. Matt Jochmans from Baltimore County, Mr. Michael Sivell from Howard County, and Mr. Bryan Schumaker from Carroll County. The group held its first meeting at TU on March 30. Each of these individuals serves as a very valuable contact point between TU and the Physics teachers of their respective systems. We are currently working with Harford County to get a representative from their system.
- *Monthly Email to Area Physics Teachers* – The first newsletter using an email format was sent out in April to forty-one Physics teachers in Baltimore County schools. It contained information about the PhysTEC project at TU, several websites where free Physics posters were available, a site where enrichment material on the design of guitar pickups could be forwarded to students studying electromagnetism, information about awards to Outstanding Physics teachers, and a note about contacting us about any student interested in teaching Physics as a career. As we obtain more Physics teacher listserves from other local educational systems, we will expand the range of our newsletter.
- *Professional Development* – A one-day professional development presentation is being developed and will be given to Baltimore County Physics teachers in August by Mr. Jim Selway and Mr. Steve Shaw, one of our TAG members. The topic is "Approaching Simple Circuits Using the Current Model." It is based on Physics research done by Dr. Lillian McDermott and Dr. Peter Shaffer of the University of Washington. Giving the presentation allows a chance for the PhysTEC recruitment message to be presented once again to high school Physics teachers.
- *PhysTEC Website*- We are currently developing a PhysTEC website as part of our grant. The home page will contain links to our recruiting strategies, our mentoring strategies, our activities, and the minutes of our TAG meetings. There will also be pages for prospective students and current Physics teachers.
- *AAPT/PhysTEC Conference*- On May 19–23, Dr. Ron Hermann and Mr. Jim Selway will be attending the Physics Teacher Education Coalition Conference in Austin, Texas. They will be attending conferences on Learning Assistants, building physics teacher education programs, and recruiting physics teachers. They will also be members of a panel discussing the value of early teaching experiences.
- *Visit from Western High School students* - On Thursday, April 28, a group of physics students from Western High School in Baltimore City visited the Department of Physics, Astronomy and Geosciences through Dr. Ron Hermann's Pepsi Grant designed to support PhysTEC initiatives. Twenty-two students had the opportunity to visit

the campus and learn more about careers in physics, physics majors at Towson University, and the manner in which undergraduate students conduct research with TU faculty. The students had the opportunity to interact with PAGS faculty in several ways including attending an astrophysics class taught by Dr. Thomas Krause, learning about applying to colleges and navigating the financial aid process with Annie McMahon (TOPS program director) and participating in a laboratory activity with physics TIR Jim Selway. The Western students also interacted with PAGS students by attending a poster session where TU students presented their research conducted with faculty.

STEM Leaders

This year, TriBeta won the Penny Wars, and sent over $200 to their charity, CLAW.

We held the first annual STEM leaders Olympiad, which is a competition between the STEM clubs. SPS won the coveted STEM cup and will have possession of it until the next Olympiad.

The STEM Leaders Olympiad 2011 was held on April 27 in the Glen.

CLUB NEWS

Women in Science

We kicked off the semester tie-dying our club t-shirts and held our annual plant sale with MSTC this year. We actively participated in Penny Wars and collected donations to send to The House of Ruth. Our club attended the annual Women in Science Forum and participated in Relay for Life with the other STEM clubs in “Science against Cancer.” We also had a team in the first annual STEM Olympiad!

Math Club

This spring the Math Club celebrated Pi Day with a new location and new students. It was successful in bringing students and faculty together to enjoy both pie and little known facts about Pi. We welcomed three new members during the course of the day and everyone is looking forward to the event next year! We also celebrated the publishing of our new Towson website this semester, www.towson.edu/mathclub, so that we can stay updated on events and share information with our future members.

TOPS (Towson Opportunities in STEM)

Outreach

On April 27, Annie McMahon attended the Baltimore City Community College Major Decision Day. At this event she spoke with students at BCCC who were in general studies and investigating possible STEM majors.

Western High School students visited campus on April 28 courtesy of Dr. Ron Hermann and the Department of Physics, Astronomy, and Geosciences. TOPS staff member, Annie McMahon was available to answer questions the high school juniors had on the college application process and financial aid.

A group from Baltimore City Community College visited campus on April 29. These students took a tour of pertinent academic buildings given by Tyrone Smith, met with TOPS staff and students, and became more comfortable with campus in general.

Presentations

On March 28 at the 241st American Chemical Society National Meeting and Exposition, TOPS Student Abdulafeez (Deji) Oluyadi and his mentor Dr. Clare N. Muhoro presented their paper “Titanium(II)-catalyzed hydroborations of unsaturated heteroatomic substrates.”

At the Student Research and Scholarship Expo held on April 21, TOPS students Nyshia Garcia and Chibueze Amaefule presented “Detection of Misidentified T. Cacao plants in the San Juan Estate Genebank.” Moses Demehin presented “Identifying Intragenic sORFs in Escherichia coli,” Abdulafeez (Deji) Oluyadi presented “Titanium (II)-catalyzed Hydroborations of Unsaturated Heteroatomic Substrates,” and Tyler Goehringer presented “Effects of Thermal Annealing Process of Rare Earth Manganese Oxide Thin Films” and “Early Classroom Experience in Physics Education.” Tyler and Deji presented yet again at the Fisher College of Science and Mathematics Convocation on May 1.

Dr. Jane L. Wolfson, in her role as Program Director for TOPS, and Annie McMahon, TOPS Program Coordinator were again invited to present highlights of the TOPS program at the annual STEP grantees meeting. Their presentation on “Increasing Retention via Cohort-Building” was very well received.