



The Jess and Mildred Fisher College of Science and Mathematics

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ELECTRONIC NEWSLETTER

September 2011



OFFICE OF THE DEAN

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

Dear Friends,

The Fall 2011 semester is now in full swing, and the Fisher College is working hard! We had a productive and eventful summer, for sure. One highlight was the National Federation of the Blind's Youth Slam, a week-long residential experience in mid-July providing opportunities for 150 blind students and their 50 blind mentors from across the nation to study numerous topics in science. Activities included shark dissections led by Prof. Jay Nelson, a class on the wonderful world of minerals by yours truly, and many more.

The Fall semester also brings us several new faculty and staff – welcome to all! You will find their names and positions listed at the beginning of each department's contribution to the newsletter.

Towson University will also be getting a new President. I had the pleasure of serving on the Presidential Search Committee this summer, and it was a great experience. The good reputation of Towson University and of the University System of Maryland made our pool of candidates extraordinarily strong. We conducted a number of interviews (one interrupted by the M=5.8 Virginia earthquake), and then the committee sent the names of our three top finalists to the Board of Regents. The Board interviewed all three and chose Dr. Maravene S. Loeschke, currently the President of Mansfield University in Pennsylvania. Dr. Loeschke will join us in January.

I've recently accepted a new task which I hope will ultimately be good for the reputation of the college and the university. I've been appointed to chair the governor's Marcellus Shale Safe Drilling Initiative Advisory Commission, a body that will study and make recommendations concerning whether, and under what conditions, the State of Maryland will grant permits for horizontal drilling and hydraulic fracturing to extract natural gas in western Maryland. This appointment allows me to use my geological background in service to the community. It's not quite the same as teaching geology and carrying out research with students, but it's going to be pretty satisfying, nonetheless.

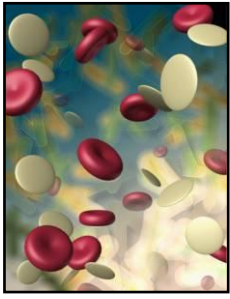
Please enjoy scanning the FCSM Newsletter!

Sincerely,

David A. Vanko
Dean

Gifts... from the Development Office

Covering the true cost of a student's education takes more than tuition and state assistance. To experience the enriching activities that define the best colleges and universities, our students must rely on your generosity. It is only through the combined resources of tuition, state support and private contributions that Towson University can help its students develop their full potential. Please consider a gift in support of the Jess and Mildred Fisher College of Science and Mathematics. To make your gift now go to www.towson.edu/supportTU



DEPARTMENT OF BIOLOGICAL SCIENCES

New Faculty and Staff

The Department of Biological Sciences would like to welcome two new faculty members, Dr. Elana Ehrlich and Dr. Peko Tsuji, a new lecturer Ms. Mickey Dehn, and one new staff member, Ms. Cindy Evans.

Dr. Ehrlich received her Doctor of Philosophy in molecular microbiology and immunology from Johns Hopkins University and her Bachelors of Science in biology from the University of Massachusetts. Her research interests are focused on the modulation of cellular pathways by viruses. Before joining the faculty at Towson University, Dr. Ehrlich was an Adjunct Professor at Stevenson University where she taught microbiology.

Dr. Tsuji received her Doctor of Philosophy degree in biomedicine/molecular biology from the University of South Carolina. She also holds Master's degrees in marine biology, public health, and biology from the University of South Carolina, Johns Hopkins University, and Johann Wolfgang von Goethe University, respectively. Before joining the faculty at Towson University, Dr. Tsuji was a Postdoctoral Fellow in the Cancer Prevention Fellowship Program at the NIH/National Cancer Institute. Dr. Tsuji's research interests include cancer prevention using dietary components such as the micronutrient selenium and plant polyphenols.

Ms. Dehn obtained her Bachelor of Arts degree in biological sciences from the University of Delaware and her Master's in biology from Towson. Ms. Dehn's research focused on the physiology of wood-eating catfish and she is teaching Anatomy and Physiology here at Towson.

Ms. Evans is our new Administrative Assistant and began work in August. Previously, Ms. Evans was employed by Perry Hall Christian School.

Student Research

Two students from Megan May's labs made presentations at a national meeting this summer:

A.V. Arjoon, M. May. "The Use of Mycoplasmas as a Tool for the Characterization of Novel Antimicrobials." American Society for Microbiology 111th General Meeting May 2011, New Orleans, LA.

N. Chaban, J.A. Jones, M. May. "A Retrospective Analysis to Determine the Global Disease and Economic Burden of Sexually Acquired Mycoplasmosis." American Society for Microbiology 111th General Meeting May 2011, New Orleans, LA.

Teal Richards-Dimitire (Rich Seigel, major professor) presented a paper at the Ecological Society meetings in Austin, Texas entitled "Spatial ecology of Northern Map Turtles (*Graptemys geographica*) in an altered river system."

Scott Farnsworth (Rich Seigel, major professor) presented a paper at the Northeast Partners in Amphibian and Reptile Conservation meetings in Annapolis, Maryland entitled "On-Site and Off-Site Translocations of Eastern Box Turtles: Lack of Difference May Point to Ranavirus."

Grants and Donations

Barry Margulies received word that his NIH R15 grant proposal has been recommended for funding at the rate of \$300,000 over three years.

Rich Seigel received a grant for \$87,080 for 2011-2013 from Exelon Corporation for his project "Nesting and Basking Ecology of Northern Map Turtles in the Susquehanna River: Impacts of Human Disturbance and Effectiveness of Mitigation Measures."

Publications

M. May, D.R. Brown. "Diversity of Expressed vH_A Adhesin Sequences and Intermediate Hemagglutination Phenotypes in *Mycoplasma synoviae*." J Bacteriol. 2011; 193(9): 2116-21.

D.R. Brown, W.G. Farmerie, M. May, G.A. Benders, A.S. Durkin, K. Hlavinka, J. Hostetler, J. Jackson, J. Johnson, R.H. Miller, V. Paralanov, D. Radune, B. Szczypinski, J.I. Glass. "Genome Sequences of *Mycoplasma alligatoris* A21JP2T and *Mycoplasma crocodyli* MP145T." J Bacteriol. 2011; 193(11): 2892-3.

M. May, D.R. Brown. "Retrospective Survey for Sialidase Activity in *Mycoplasma pneumoniae* Isolates from Cases of Community-Acquired Pneumonia." BMC Research Notes 2011, 4: 195.

Ford, N. B. and R. A. Seigel. 2011. "Offspring Size Variation in Snakes." Pp. 573-586 In: R. Aldridge and D. M. Sever (eds), Reproductive Biology and Phylogeny of Snakes. CRC Press, Florida.

Presentations

Joel Snodgrass made an invited presentation at the American Fisheries Society meetings in Seattle title, "Potential Population Level Consequences of Network Structure for Headwater Fishes."

Susan E. Gresens, Elisabeth Stur and Torbjørn Ekrem. 2011. "Where to draw the line? Phenotypic variation within the *Cricotopus sylvestris* species group, across a nearctic-palaeartic gradient." Presented at the 18th International Symposium on Chironomidae, Norwegian University of Science and Technology, Trondheim, Norway, July 5.

Journal and Reviewing Activity

Joel Snodgrass reviewed manuscripts for Environmental Pollution, Herpetologica, Science of the Total Environment, and Oecologia this past summer.

Sarah Haines wrote two book reviews on children's science books for the National Science Teachers Association.

Sarah Haines reviewed a manuscript for the Journal of College Science Teaching.

Community Outreach

Barry Margulies hosted a local math teacher as part of the BEST project, an elementary science teacher as part of the FDR project, and an undergraduate student as part of the Bridges program.

Sarah Haines and Cindy Ghent conducted a workshop for early childhood education students at Catocin High School in Frederick County. Students were trained in the use of the American Forest Foundation's curriculum "Environmental Experiences for Early Childhood."

Sarah Haines conducted an 8-day summer institute along with the Baltimore Ecosystem Study for middle and high school science teachers in Baltimore City and Baltimore County. Topics covered included carbon, water, biodiversity, and environmental literacy.

Sarah Haines served as a volunteer naturalist at Assateague State Park for two weeks in August. Dr. Haines presented many opportunities for visitors to learn more about the wildlife living on the island.

Other Activities

Barry Margulies and graduate student Ashley Nelson attended the Annual Herpesvirus symposium at Pennsylvania State University in June.



DEPARTMENT OF CHEMISTRY

New Faculty

The Department is pleased to welcome a new tenure track Assistant Professor in Fall 2011. Kathryn (Beth) Kautzman, our new analytical chemist, received her B.S. in Chemistry from Hendrix College and Ph.D. in Physical Chemistry from the University of California, Berkeley. Beth was a Postdoctoral Fellow at the California Institute of Technology and an NRC Postdoctoral Fellow at the National Institute of Standards and Technology. Her research interests are in using spectroscopic methods to analyze aerosols and other atmospheric pollutants.

Publications

David Ownby and Ryan Casey were coauthors on the following paper. M. T. Gallagher and A. B. Brand are graduate students in the Masters in Environmental Science program.

Gallagher, M.T., J.W. Snodgrass, D.R. Ownby, A.B. Brand, R.E. Casey, S.M. Lev. 2011. "Watershed-scale analysis of pollutant distribution in stormwater management ponds." Urban Ecosystems 14(3):469-484.

David Ownby was a coauthor on the following paper:

Zhou, D-M., L-Z. Li, W.J.G.M. Peijnenburg, D.R. Ownby, A.J. Hendriks, P. Wang, D-D. Li. 2011. "A QICAR approach for quantifying binding constants for metal-ligand complexes." Ecotoxicology and Environmental Safety 74(2011):1036-1042.

Sonali Raje, together with Mike Krach and Gail Kaplan of the Mathematics Department submitted a manuscript entitled "Critical-Thinking Skills Enhancing Challenge Puzzle" to the journal Mathematics Teacher.

Shannon Stitzel coauthored the following review article:

Stitzel, S. E., Aernecke, M. J.; Walt, D. R., "Artificial noses." Annual Review of Biomedical Engineering 13, 1-25, (2011).

Summer Undergraduate Research

Bok-Eum Choi (research mentor: Ana-Maria Soto) was the 2011 Ronald and Linda Raspet Summer Research Fellow.

Tim Brunker mentored Caroline Christensen with funding from the Fisher Chair.

Faculty Professional Development

David Ownby reviewed articles for Environmental Pollution, Aquatic Toxicology, and Bulletin of Environmental Contamination and Toxicology.

Department Seminar

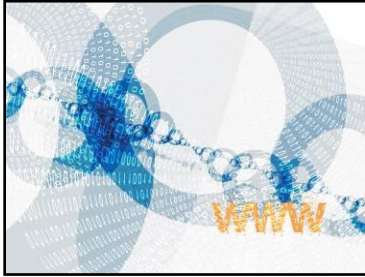
Beth Kautzman gave an interview seminar on July 7, entitled "Unraveling Uncertainties in Global Climate Change: Evaluating the Chemical and Physical Properties of Atmospheric Aerosols."

Campus and Community Outreach

Ellen Hondrogiannis held a workshop for TOPs students August 18-19. This consisted of a lab titled, "Comparison of Energy Content of Fuels," report writing and an exercise in graphing.

Forensic Programs

Ellen Hondrogiannis presented a short class for Symbio Studios on the use of GC/MS in forensics on June 8. Ellen Hondrogiannis and Joe Harant presented a three-day course titled, "Analysis of Low Explosives" to forensic science professionals, July 20-22. The course was given under the aegis of the Forensic Science Training Institute, a federally funded program at Towson.



DEPARTMENT OF COMPUTER AND INFORMATION SCIENCES

New Faculty

The Computer and Information Sciences Department would like to welcome our two new faculty members: Dr. Michael McGuire and Dr. Ziyang Tang.

Dr. McGuire holds Doctor of Philosophy and Master of Science degrees in Information Systems from UMBC and a Bachelor of Science in Geography from Towson University. His research interests include spatio-temporal data mining, data warehousing, sensor database systems, environmental informatics, and information visualization. Before joining the faculty at Towson University, Dr. McGuire was a Research Scientist at the Center for Urban Environmental Research and Education at UMBC where he pursued research in environmental informatics and managed the Center's information infrastructure.

Dr. Ziyang Tang received her Ph.D. degree in Computer Science from the University of Texas at Dallas. Before that, she worked as a researcher in the Fraunhofer Institute for Computer Graphics (Institut für Graphische Datenverarbeitung) at Darmstadt, Germany, and the Fraunhofer Institute for Graphic Interfaces at Seoul, Korea. Her research interests include Multimedia Streaming, Computer Graphics and Animation, Virtual Reality, and Human Computer Interaction.

New Staff

The Computer and Information Sciences Department would like to welcome our new staff member: Ms. Julie Uhl to be our department secretary, she started Friday, September 23rd.

Publications and Presentations

Alfreda Dudley and Subrata Acharya were invited speakers to the Cyberwatch STEM summer camp program for Howard County 9th grade computer and math students held on July 11 at the Application Research Laboratory in Ellicott City, MD.

James Braman, Alfreda Dudley, and Giovanni Vincenti presented a paper entitled "Death, Social Networks and Virtual Worlds: A Look into the Digital Afterlife" at the 9th ACIS International Conference on Software Engineering Research, Management and Applications (SERA2011) held on August 10-12 in Baltimore, MD.

Kevin Reed (doctoral student AIT) and Gabriele Meiselwitz (advisor) presented a paper "Teacher Agents: The Current State, Future Trends, and the many Roles of Intelligent Agents in Higher Education" at HCI International 2011 (Human Computer Interaction International), Orlando, FL, July 9-14.

Portia Pusey (doctoral student ISTC) and Gabriele Meiselwitz (advisor) presented a paper "Assessment in large- and small- scale Wiki Collaborative Learning Environments: Recommendations for Educators and Wiki Designers" at HCI International 2011 (Human Computer Interaction International), Orlando, FL, July 9-14.

Christopher Connolly (doctoral student AIT) and Gabriele Meiselwitz (advisor) presented a paper "Use of Social Networking in Education and Senior Users" at HCI International 2011 (Human Computer Interaction International), Orlando, FL, July 9-14.

Jonathan Lazar and doctoral student Abiodun Olalere published a paper titled "Accessibility of U.S. Federal Government Home Pages: Section 508 Compliance and Site Accessibility Statements" in the journal Government Information Quarterly.

Jonathan Lazar and recent doctoral graduate Brian Wentz published a paper titled "Separate but Unequal: Web Interfaces for People with Disabilities" in User Experience Magazine.

Jonathan Lazar and Paul Jaeger and John Bertot (both professors at the University of Maryland) published a chapter titled "Persons with disabilities and physical and virtual public library settings" in the book Public Libraries and the Internet: Roles, Perspectives, and Implications.

Jonathan Lazar and doctoral student Abiodun Olalere presented a paper titled "Investigation of Processes for Maintaining Section 508 Compliance in U.S. Federal Web Sites" at the Human Computer Interaction International Conference, July 2011 in Orlando, Florida.

Jonathan Lazar and recent doctoral graduate Brian Wentz presented a paper title "Web-based Calendaring for Blind Users" at HCI 2011, the 25th annual conference of the British Human-Computer Interaction Group, July 2011 in Newcastle, UK.

Jonathan Lazar, recent doctoral graduate Brian Wentz, and 13 undergraduate students presented a paper titled "Potential Pricing Discrimination Due to Inaccessible Web Sites" at the INTERACT 2011 Conference, September 2011 in Lisbon, Portugal.

Jonathan Lazar also gave presentations about information technology and accessibility for people with disabilities at:

- Summer Social Webshop on Technology-Mediated Social Participation, held at the University of Maryland College Park, August 23.
- Innovation with Accessibility Policy Institute, sponsored by the Ohio Board of Regents, Columbus, Ohio, July 25.
- EDUCAUSE/Cornell University Institute for Computer Policy and Law, Ithaca, NY, July 20.
- Training Session for US Federal Section 508 coordinators, Ballston, Virginia, June 22.
- DC chapter of the Usability Professionals Association, Washington DC, June 8.

Jiajin Lei (Johns Hopkins University), Chao Lu and Zhenkuan Pan (Qingdao University) had their paper "Enhancement of Components in ICA for Face Recognition" published on the proceedings of SERA 2011 International Conference, August 10-12, Baltimore, MD.

Wei Yu, Nan Zhang, Xinwen Fu, and Brian Rivera, "Evolution of Widely-Spreading Worms and Countermeasures: Epidemic Theory and Application," Book Chapter in Handbook on Securing Cyber-physical Infrastructures: Foundations and Challenges (In press) September 2011.

Xinyu Yang, Jie Lin, Wei Yu, Xinwen Fu, Genshe Chen, and Erik P. Blasch, "On Situational Aware En-route Filtering against Injected False Data in Cyber Physical Networks." Book Chapter in Situational Awareness in Computer Network Defense: Principles, Methods and Applications, IGI-Global, USA (in press) September, 2011.

Xin Jin, Min Dan, Nan Zhang, Wei Yu, Xinwen Fu, and Sajal K. Das, "Game Theory for Infrastructure Security - The Power of Intent-Based Adversary Models," Book Chapter in Handbook on Securing Cyber-physical Infrastructures: Foundations and Challenges (In press) September 2011.

Qingyu Yang, Jie Yang, Wei Yu, Nan Zhang, and Wei Zhao, "On a Hierarchical False Data Injection Attack on Power System State Estimation," in *Proc. of IEEE Globe Communication (Globecom)*, December 2011.

Jie Lin, Xinyu Yang, Wei Yu, and Xinwen Fu, "Towards Effective En-route Filtering against Injected False Data in Wireless Sensor Network," in *Proc. of IEEE Globe Communication (Globecom)*, December 2011.

Difan Zhang, Wei Yu, and Rommie Hardy, "A Distributed Network-Sensor Based Intrusion Detection Framework in Enterprise Networks," in *Proc. of IEEE Military Communication (Milcom)*, November 2011.

Peng Zhao, Xinyu Yang, Chiyong Dong, Shusen Yang, Sulabh Bhattarai, and Wei Yu, "On an Efficient Estimation of Available Bandwidth for IEEE 802.11-based Wireless Network," in *Proc. of IEEE Globe Communication (Globecom)*, December 2011.

Marius Zimand has presented the paper "Symmetry of information and bounds on nonuniform randomness extraction via Kolmogorov extractors," at the 26th IEEE Conference in Computational Complexity, CCC'2011, San Jose, California, June 8-10. He has also presented the paper "On the optimal compression of sets in PSPACE," at 18th International Symposium on Fundamentals of Computation Theory, FCT'2011, Oslo, Norway, 22-25 August 2011. The paper "Generating Kolmogorov random strings from sources with limited independence" by Marius Zimand has been accepted for publication in the Journal of Logic and Computation.

Services to the Discipline

Alfreda Dudley served as Session Chair and Paper Reviewer for the 15th Annual Colloquium for Information Systems Security Education (CISSE) held on June 13-15 in Fairborn, Ohio.

Gabriele Meiselwitz served as a session chair (Session: Higher Education and Social Computing Applications) at HCI International 2011 (Human Computer Interaction International), Orlando, FL, July 9-14

James Braman reviewed an article for the International Journal of Computers & Education.

Jonathan Lazar was a panelist on the panel "The Policy Challenges of Universally Usable E-Government" at the Digital Government Conference, June 2011 in College Park, MD.

Jonathan Lazar was an invited guest blogger on disability.gov, titled "Federal Government Website Accessibility-Still a Long Way to Go" on June 29, available at: <http://blog.govdelivery.com/usodep/2011/06/federal-government-website-accessibility-still-a-long-way-to-go.html>

Wei Yu gave an invited talk as a panel speaker, "Security in Smart Grid: Challenges and Potential Solutions," the Second China Smart Grid Summit, 2011.

Grants & Awards

Chao Lu received confirmation on a grant award from Air Force Office of Scientific Research (AFOSR), "Efficient Algorithms for Error-free Matrix Operations Using P -adic Exact Scientific Computational Library (ESCL)," the research grant is for three years.

Wei Yu received a grant from National Science Foundation (NSF), "Membership Inference in a Differentially Private World and Beyond" 09/01/2011-08/31/2014 (PI), \$164,040.

Wei Yu received a grant from Army Research Laboratory (ARL), "A Distributed Host-Based Intrusion Detection Framework for Mission Critical Network Operation," 05/15/2011-05/14/2014 (PI), \$154,333 (first year - \$50,690).

Announcements

Chao Lu (conference chair) and Yeong-Tae Song (program chair) organized an international conference on Software Engineering, Research, Management and Application (SERA2011) that was held in Radisson Plaza Lord Baltimore from August 10-11. There were 68 original research papers submitted and 47 papers were selected for presentation. Out of 47, 11 papers were published by Springer Studies in Computational Intelligence (SCI) and remaining 36 papers were published by IEEE. There were 103 program committee members from all over the world reviewing all the submitted papers for the conference and almost all the accepted papers were presented by the authors from 11 different countries. Helen Harrison served as Registration/Finance chair for the conference.

On Friday, September 9, the Computer Information Sciences department and the Baltimore ACM co-hosted the symposium *Securing our Future: Preparing Students for the Cyber Workforce*. Over 85 attendees, including students, educators from Maryland schools, and representatives from NSA, heard Robert Seacord of CERT/Carnegie Mellon University, Eric Sheridan (TU '06) of White Hat Security/Infrared Security, and Davina Pruitt-Mentle of Educational Technology Policy, Research and Outreach and CyberWatch, discuss the security skills necessary for the workplace and the role of education in preparing students and teachers for the cyber challenges of the future.



DEPARTMENT OF MATHEMATICS

New Faculty

The department is pleased to welcome Dr. Diana Cheng as an Assistant Professor in Mathematics Education. Dr. Cheng received her Ed.D. in Mathematics Education, in 2010, from Boston University.

The department is also pleased to welcome Dr. Min Ji as an Assistant Professor in the area of Actuarial Science and Risk Management. Dr. Ji received her Ph.D. degree in Actuarial Science, in July 2011, from the University of Waterloo, Canada.

New Staff

The department is pleased to welcome Ms. Shannon Helm as the new Administrative Assistant II of the department. Ms. Helm served as the Summer Session Coordinator at Lehigh University for nine years and as the Administrative Assistant to the Dean of Lafayette College (Pennsylvania) for eight years.

The department is also pleased to welcome Ms. Diana Bohle as the new Administrative Assistant I of the department. Ms. Bohle comes to the department with four-year administrative experience with the Department of Computer and Information Sciences.

Grants

The CoSMiC Scholarship program has been awarded more than \$580,000 from the NSF to support scholarship aid to Towson undergraduates majoring in MB3, mathematics, or the computing sciences for the years 2011-2015. We welcome a new cohort of students this fall. Martha Siegel is PI, Gail Gasparich and Gabriele Meiselwitz are co-PIs, and Virginia Anderson is the evaluator on the project. CoSMiC Scholarships have been available to eligible students since 2002.

Papers Published or Accepted for Publication

Sergiy Borodachov's paper "Asymptotics for the minimum Riesz energy and best-packing on sets of finite packing premeasure" was accepted for publication in [Publicacions Matemàtiques](#).

Sergiy Borodachov's paper "Inequalities for the norms of finite difference operators of multiply monotone sequences" (joint with Yuliya Babenko) was accepted for publication in [Mathematical Inequalities and Applications](#).

Linda Cooper's paper "Measuring Stream Discharge" (joint with Martin Roberge of Geography and Environmental Planning) was accepted for publication in the NCTM's [Mathematics Teacher](#).

Geoffrey Goodson's paper "Spectral doubling of normal operators and connections with anti-unitary operators," was accepted for publication in Integral Equations and Operator Theory.

Russell Hendel's (Adjunct Faculty) paper, "Kimberling's $[n^2 \alpha] - n[\alpha]$ " was published in The Fibonacci Quarterly, Volume 49, Number 3 (2011), pp. 211-220.

Russell Hendel's paper, "Visual Representations of Biblical Poetic Parallelism," presented at the Bridges Conference, held in Portugal in July 2011, was published in The Proceedings of Bridges Coimbra, 2011: Mathematics, Art, Music and Architecture, pp. 279-286.

Russell Hendel's paper, "A Guideline Checklist To Avoid Writer Bias in Social Science Instruction," presented in Orlando, Florida in July 2011, at the 9th International Conference on Education and Information Systems, Technologies and Applications: EISTA 2011, in the context of the 5th International Multi-Conference on Society, Cybernetics and Informatics: IMSCI 2011, was published in the Proceedings of EISTA 2011.

Xuezhong Hou's paper, "Coupled Linear Feedback and Sliding Model Control for a Serially Connected Euler-Bernoulli Beam," accepted for publication by International Journal of Pure and Applied Sciences and Technology.

Xuezhong Hou's paper, "An Optimal Distributed Control for Age-dependent Population Diffusion System," (co-authored with J. Fu and R. Chen), was accepted for publication by General Mathematics Notes.

Xuezhong Hou's paper, "Existence principle of an Optimal Control for a Flexible Beam with Three Tuning Axles," has been published in the Proceedings of the 2011 IEEE International Conference on Automation and Logistics, pp. 477-482.

Alexei Kolesnikov and Angel Kumchev's paper "Estimation of the commodity flow of chlorine from storage data" (joint with TU undergraduates Dennis Howell, Patrick O'Neill and Matthew Tiger) was accepted for publication in the Journal of Transportation Security.

Angel Kumchev's paper "On sums of Ramanujan's sums" (joint with T.H. Chan) was accepted for publication by Acta Arithmetica.

Tatyana Sorokina's and Sergiy Borodachov's paper "An optimal multivariate spline method of recovery of twice differentiable functions" will appear in BIT Numerical Mathematics, Volume 51, Number 3, pp. 497-511.

Conference and Seminar Presentations

Sergiy Borodachov presented the following talks:

"Optimal recovery of certain classes of multivariate functions" (50-minute talk, joint work with V.F. Babenko and B.D. Bojanov) at the Approximation Theory and Harmonic Analysis Workshop held at Kennesaw State University, May 14-15;

"Characterization of the optimal coefficients of cubature formulas on certain classes of continuous functions" (joint work with V.F. Babenko) at the International Symposium in Approximation Theory held at Vanderbilt University, May 17--20;

"Optimal cubature formulas related to tomography for tensor products of certain classes of functions" (joint work with V.F. Babenko and D.S. Skorokhodov) at the Conference on Computational Complex Analysis and Approximation Theory held in Protaras, Cyprus, June 5-11;

"Optimal multivariate spline methods for recovery of twice differentiable functions" (joint work with Tatyana Sorokina) at the International Conference in Modern Analysis held in Donetsk, Ukraine, June 20-23;

"Optimal cubature formulas related to tomography" (joint work with V.F. Babenko) and "An optimal multivariate spline method of recovery on isotropic classes of twice differentiable functions" (joint work with Tatyana Sorokina) at the 7th International Congress on Industrial and Applied Mathematics held in Vancouver, Canada, July 18-22.

"An Extension of DNA Splicing System(s)" by Yusof, Sarmin, Elizabeth Goode, Mahmud, and Heng, to be presented at the 2011 Sixth International Conference on Bio-Inspired Computing: Theories and Applications (BIC-TA 2011), Universiti Sains Malaysia, Penang, Malaysia, September 27 - 29, 2011. This conference paper will be indexed by IEEE, Scopus & EI and IEEE Xplore. Post-Conference Publication Information to appear.

"Hierarchy of Certain types of DNA Splicing Systems" by Yusof, Sarmin, Elizabeth Goode, Mahmud, and Heng, International Journal of Modern Physics: Conference Series, Vol 1, No. 1 (2010), pp 1-5, World Scientific Publishing. To

be presented by Ms. Yuhani Yusof at the International Conference on Mathematical and Computational Biology (ICMBC 2011) in November, 2011.

Xuezhong Hou attended the 2011 IEEE International Conference on Automation and Logistics in Chongqing, China as being the member of the Program Committee and the Section Chair of Robotics, and presented his research paper “Existence principle of an Optimal Control for a Flexible Beam with Three Tuning Axles” in the conference.

Angel Kumchev gave an invited talk on “Sums of almost equal squares of primes” at the Sixth China-Japan Conference on Number Theory in Shanghai, China, August 15-17.

Angel Kumchev gave a series of talks on “Exponential sums, prime-detecting sieves, and their applications in additive prime number theory” at the Workshop on Number Theory organized by J.Y. Liu at Shandong University at Weihai, China, from July 30 to August 14.

Martha Siegel led a panel discussion on “Education of Pre-Service Secondary Mathematics Teachers in Light of the Common Core Standards” at the summer MathFest of the Mathematical Association of America held in Lexington, KY in August. Panelists included William McCallum former chair of the Conference Board of the Mathematical Sciences and mathematics educators at the college and secondary levels.

Jay Zimmerman presented the paper, “A Portrait of a Quadrilateral Group” at the Bridges Conference on Mathematics and Art in Coimbra, Portugal on July 28. This paper was published in the Proceedings 2011, Bridges, Coimbra, pages 505 – 508.

Jay Zimmerman presented the paper, “The Number of p - Groups with Large Cyclic Subgroups” at the Conference on Group Theory at Harlaxton College in Grantham, England on August 3.

Other Presentations

Honi Bamberger was the featured speaker at the St. Mary's Magnet Academy in Columbus, Georgia on June 3. Her presentation entitled: “Mathematics Misconceptions: Strategies and Activities to Prevent or Eliminate Them” shared strategies and activities from her newly published Heinemann Publications’ books.

On June 27, Dr. Bamberger provided attendees at the Math/Science Innovation Center’s Annual Conference: Igniting the Wonder: A Conference for K-2 Teachers, with two sessions entitled: “Teaching Geometry to the Littlest of Learners.”

On August 16 and 17, Dr. Bamberger conducted two all-day in-services for the K-2 teachers and then 3 - 5 teachers from the Barrington School System, in Barrington, Illinois. These workshops were entitled: “Mathematics Misconceptions: Routines and Activities that Build Strong Conceptual and Procedural Understandings and Prevent or Eliminate Them.”

On August 25, Dr. Bamberger briefed lower and then middle and upper school teachers from The Summit School, in Edgewater, Maryland on the Common Core State Standards, the Maryland Common Core Curriculum Frameworks and the assessments being developed by PARCC.

Elizabeth Goode serves as the Primary Advisor for the 2011 Baltimore iGEM Team: The International Genetically-Engineered Machines Competition, sponsored by the Massachusetts Institute of Technology (MIT). The Baltimore iGEM Team includes five undergraduates from TU, and has been working on its synthetic biology project since May, 2011. See our [Baltimore Team wiki](#). Team Baltimore will present its work at the iGEM 2011 Regional Jamboree Purdue University in Indianapolis, IN on October 8-10. After the 3 Regional Jamborees (Americas, Europe and Asia) in October, the World Championship will be held at MIT in November, for those teams that advance.

Book Review

Lawrence Shirley's book review of Ottava: making baskets and doing geometry in the Makhuwa culture in the Northeast of Mozambique, by Paulus Gerdes; was published in the Journal of Mathematics and the Arts, Vol. 5, No. 2, June 2011, pp 101-103.

Refereeing, Reviewing and Panel Service

Raouf Boules refereed an article for The Journal of Signal, Image and Video Processing.

Russell Hendel wrote a paper review that was published in the Mathematical Reviews.

Russell Hendel refereed or is refereeing papers for The College Math Journal, International Conference on Design and Modeling in Science, Education, and Technology: DeMset 2011, and the International Conference on Education, Informatics, and Cybernetics: icEIC 2011.

Xuezhong Hou refereed a paper for an Elsevier journal, Applied Mathematics and Computation, and reviewed eight papers for IEEE-ICAL 2011.

Jay Zimmerman refereed two papers, “Quasi-central elements and p-nilpotence of finite groups” and “The influence of complemented minimal subgroups on the structure of finite groups” for Zentralblatt für Mathematik.

Other Professional Activities and News

On the evening of August 10, the first meeting of the newly chartered Maryland Association of Mathematics Teacher Educators (an affiliate of the Association of Mathematics Teacher Educators and the National Council of Teachers of Mathematics), was held at the home of Dr. Honi Bamberger. The elected executive committee has three members of Towson University's faculty: Dr. Bamberger is the recording secretary, Ms. Judith Macks is the treasurer, and Dr. Ming Tomayko is one of the elected members-at-large.

Sergiy Borodachov organized a minisymposium “Optimal Recovery Problems” (MS409) at the 7th International Congress on Industrial and Applied Mathematics held in Vancouver, Canada, July 18-22.

Elizabeth Goode was the Ph.D. Co-Supervisor for Yuhani Binti Yusof, Doctor of Philosophy (Mathematics), Universiti Teknologi Malaysia (UTM). Main Supervisor: Dr. Nor Haniza Sarmin, UTM. Ms. Yusof was at Towson University between Sep 24, 2010 and March 18, 2011, working with Dr. Goode on DNA Splicing Systems, both theoretical (dry splicing) and in the laboratory (wet splicing). She will defend her dissertation in November, 2011. Special thanks to Roland Roberts for allowing the MD-Malaysia DNA Splicing Group the use of his lab.

Russell Hendel is on the Program Committee for the 10th International Conference on Education and Information Systems, Technologies and Applications: EISTA. The main conference goal is to bring together researchers and practitioners from the education/training and information/communication technology (ICT) areas, in order to support the bridging process between education/training and ICT communities (ICT).

Jay Zimmerman was elected the Vice-Chair of the Council of University System Faculty (CUSF) for the year 2011–2012. His duties will include setting the CUSF agenda with the rest of the Executive committee, organizing the Chancellor's meeting with the Senate Chairs of all the USM schools and filling in for the Chair as needed. He is also the chair of the CUSF Regent's Faculty Awards committee for 2011–2012.

Services to the Discipline

In June, Dr. Honi Bamberger read and responded to recommendations being made to the Governing Board of the Maryland State Education Association (MSDE) regarding the College Readiness Assessments in mathematics.

On June 16 and 17, Dr. Bamberger worked with the middle school mathematics teachers and met with school administrators at the B.R.I.C.K. Avon School in Newark, New Jersey. This high poverty school, applying for a State Improvement Grant (SIG) for the 2011-2012 academic year, asked for an assessment of test results and assistance in planning for the new academic year.

On July 21, Dr. Bamberger, along with other Towson University colleagues, met with leaders at Port Discovery in Baltimore, to discuss possible liaisons between the university and this center for young children. A follow-up meeting on TU's campus, attended by Dr. Bamberger, was held on August 9.

On Wednesday, August 10, Dr. Bamberger addressed the Leadership Group of the College of Education sharing information about the Common Core State Standards, the Maryland Common Core Curriculum Frameworks (draft) and the assessments being developed by the Partnership for the Assessment of Readiness for College and Careers (PARCC). A similar meeting was conducted by Dr. Bamberger, for her colleagues in the Mathematics Department on August 19.

Mathematics Department Colloquia Seminars and Talks

On Friday, September 16, the Approximation Theory/Financial Math (ATFM) seminar hosted its first talk. The talk was given by graduate student Leopold Nguetgnia.



Dr. Zimmerman's presentation in Coimbra, Portugal, July 2011



DEPARTMENT OF PHYSICS, ASTRONOMY & GEOSCIENCES

The Department of Physics, Astronomy, and Geosciences would like to welcome four new faculty members. Joel Moore joins our geosciences group, Asli Sezen joins our science education faculty and will lead our departmental efforts regarding the middle school certification program, Jia-An joins our condensed matter physics group, and Parviz Ghavamian is joining our astrophysics group. Additionally, Alireza Rafiee has been hired in a post-doctoral research position and Jim Selway will continue his duties as a teacher in residence. Finally, the department welcomes Renee Watkins as our new Administrative Assistant II.

Grants and Grant Proposals

Dr. Jia-An Yan submitted a pre-application to the DOE Early Career Award program on September 1.

Dr. Vera Smolyaninova received a grant from NSF DMR-1104676 entitled "Broadband Transformation Optics Devices," it is a three year grant for a total amount of \$300,000.

Ron Hermann and Cody Sandifer were awarded a \$171,974 Improving Teacher Quality grant through the Maryland Higher Education Commission. Their project entitled, "BCPS Middle School Physics Instruction and Readiness (BCPS

MPIRE)" provides ongoing physics content and pedagogical professional development to 24 middle school physical science teachers in Baltimore City over the next 18 months.

Dr. Lottero-Perdue submitted a proposal on behalf of Harford Community College (HCC) to support two pilot Engineering Adventures camps at HCC for elementary children for the summer of 2011. The proposal was one of two selected for funding by the Scientific Applications International Corporation to support STEM education (funding amount: \$5,860).

Dr. Raj Kolagani (PI) was awarded an NSF GOALI grant (\$200K) for the development of uncooled infrared microbolometer arrays, in collaboration with Steven Gross of Triton Services Inc. (CoPI). Grace Yong is a senior personnel on this grant.

The following students were awarded undergraduate research grants from the FCSM and TU undergraduate research committees:

Logan Scheel - "Measurement of Nano-Structured Graphitic Carbon Using Micro-Raman Spectroscopy" (Faculty Mentor: Jeff Simpson)

Mike DeVanzo, Eugene Shanholtz, and Joshua Tyler – "Synthesis of Boron Nitride Nanotubes via chemical vapor deposition and arc-discharge" (Faculty Mentor: Jeff Simpson)

Dr. Parviz Ghavamian is co-investigator on two accepted HST programs this year. The first program is an ultraviolet spectroscopic study of the Cygnus Loop supernova remnant, with the goal of understanding how interstellar dust is destroyed in shock waves. The second program is an optical study of the supernova remnant population of the starburst galaxy M83. Both proposals were approved prior to the arrival of Dr. Ghavamian at Towson University, and both have received funding for data analysis and publication.

Publications

Ron Hermann, Rachel Burks and Steven Lev completed an introductory geology lab text titled Core Ideas in Geology: An Inquiry-based Approach published by Kendall Hunt.

Dr. Jia-An Yan published a paper entitled "Enhanced optical conductivity induced by surface states in ABC-stacked few-layer grapheme" Authors: Jia-An Yan, W. Y. Ruan, and M. Y. Chou, Phys. Rev. B 83, 245418 (2011). <http://prb.aps.org/abstract/PRB/v83/i24/e245418>

Lottero-Perdue, P.S., Nealy, J. ††, Roland, C.†, & Ryan, A.† (In press.) "Caught on video! Using handheld digital video cameras to support evidence-based reasoning." Science & Children. †† = teacher co-author; † = science leader co-author.

Lottero-Perdue, P.S. (2011). "Classroom teacher – enrichment teacher pairs: Co-Teaching as a means to implement elementary engineering education." *Proceedings (peer reviewed) of the 2011 American Society for Engineering Education (ASEE) Annual Conference and Expo, Vancouver, CA, June 26-29. Note: This paper was awarded the Best Paper honor by the K-12 Division of the American Society for Engineering Education for the 2011 conference.*

Lottero-Perdue, P.S. (2011). "Making elementary engineering work: Lessons from partnerships and practice -The SySTEMic Project, Maryland." *Proceedings (peer reviewed) of the 2011 ASEE Annual Conference and Expo, Vancouver, CA, June 26-29.*

Sandifer, C. (In Press). "Inquiry science and active learning: Pairing a force and motion lesson with a 'blackout' reading activity." Science and Children.

Jeff Simpson co-authored a paper entitled "Separation of Empty and Water-Filled Single-Wall Carbon Nanotubes," ACS Nano 5, 3943 (2011).

Dr. Parviz Ghavamian was co-author on a paper accepted for publication in the Astrophysical Journal, titled "RCW 86: A Type Ia Supernova in a Wind-Blown Bubble," by Brian J. Williams, William P. Blair, John M. Blondin, K. J. Borkowski, Parviz Ghavamian, Knox S. Long, John C. Raymond, Stephen P. Reynolds, Jeonghee Rho and P. Frank Winkler. The paper was accepted prior to the arrival of Dr. Ghavamian at Towson University.

Presentations and Abstracts

On August 10, Dr. Jennifer Scott gave a research presentation at the meeting of the Westminster Astronomical Society entitled "Quasars, Galaxies, and Everything in Between."

Dr. Rommel Miranda was a featured guest speaker for the 2011 Astronomical Society of the Pacific Annual Conference. His talk entitled, "Deep Impact," described his current research findings regarding TU's Project ASTRO site.

Dr. Rommel Miranda was invited to present a talk entitled, "The Inquiry Continuum," at the NASA Goddard Space Flight Center for 24 in-service teachers (Grades 6-12) participating the Baltimore Excellence in STEM Teaching Project in Greenbelt, Maryland.

Dr. Rommel Miranda was invited to present workshops entitled, "In the Footsteps of Galileo," with the Astronomical Society of the Pacific for 35 in-service teachers and faculty members (Grades K-20) in Baltimore, Maryland.

Dr. Rommel Miranda was invited to present the workshop entitled, "Culturally Relevant Ecology," for five RET/graduate students and in-service teachers at TU.

Dr. Rommel Miranda submitted a research paper presentation proposal entitled, "Urban high school teachers' beliefs of essential science teaching dispositions," to the 2012 Association for Science Teacher Education International Conference.

Dr. Rommel Miranda and BEST Project Director Julie Damico submitted a research paper presentation proposal entitled, "Science teachers' beliefs about the influence of their summer research experiences on their pedagogical strategies," to the 2012 National Association for Research in Science Teaching International Conference.

Dr. Rommel Miranda's paper presentation proposal entitled, "An integrated instructional approach to facilitate inquiry in the classroom," was accepted for the 2011 regional Association for Science Teacher Education Conference in Olive Hill, Kentucky.

On August 30, Dr. Joel Moore gave an oral presentation at the 2011 American Chemical Society National Meeting in Denver, CO. entitled "Recent Advances in Non-traditional Stable Isotope Geochemistry." His talk was entitled "Measuring the concentration and carbon isotope composition of atmospheric CO₂ in an urban setting using cavity ring-down spectroscopy."

Lottero-Perdue, P.S. (2011). "Best practices in K-12 Engineering: Assessments of Participant Outcomes." (Invited Panelist). *2011 American Society for Engineering Education (ASEE) Annual Conference and Expo*, Vancouver, CA, June 27.

Lottero-Perdue, P.S. (2011). "Strategies for successful careers built on an engineering degree: A non-traditional pathway." *University of Delaware Alumni Weekend Women in Engineering Panel*, June 4. (Invited talk).

Jeff Simpson presented a talk at the American Physical Society (APS) March Meeting in Dallas, TX entitled "Optical Properties of Empty and Water-Filled Single-Wall Carbon Nanotube."

Physics major Logan Scheel attended the APS March Meeting and presented a poster entitled "Opto-Electronic Properties of Nano-Structured Graphitic Carbon Measured Using Micro-Raman Spectroscopy," Logan Scheel*, Jeffery Demers*, Kevin Mead**, Jeff Simpson. * undergraduate author ** graduate author

Jeff Simpson presented a poster at the APS March Meeting entitled, "Non-polar electromagnon in hexa-YMnO₃." J. R. Simpson, A. B. Sushkov, H. D. Drew, M. Mostovoy, A. Gozar, G. Blumberg, N. Lee, and S.-W. Cheong.

Community Engagement and Professional Service

On May 27, Dr. Jennifer Scott, Dr. Rommel Miranda, and Mr. Jim Reynolds, Baltimore Project ASTRO directors and coordinator, coordinated and led the 4th Annual Baltimore Project ASTRO workshop at the Maryland Science Center to launch 17 partnerships between local astronomers and Baltimore City and County Public School teachers for the 2011-2012 academic year.



On July 19, Dr. Jennifer Scott hosted a group from the National Federation for the Blind Youth Slam Event for a presentation on constellations in the Watson-King Planetarium. The presentation was coordinated by Dr. Noreen Grice, author of [You Can Do Astronomy](#), a book on making astronomy accessible to the blind.

On July 28, Dr. Jennifer Scott hosted the Explorer Group in the Watson-King Planetarium and led a presentation on the summer sky and the solar system. The program was coordinated by the Baltimore County Police Department and the Boy Scouts for at-risk youth.

As a visiting professor, Dr. Jia-An Yan visited the Institute of Atomic and Molecular Sciences (IAMS), Academia Sinica, Taipei, Taiwan for three weeks in June.

Dr. Jia-An Yan reviewed a manuscript for the Physical Review Letters in August.

Vera Smolyaninova reviewed a paper for Applied Physics Letters.

Dr. Rommel Miranda served on the local organizing committee for the 2011 Astronomical Society of the Pacific Annual Conference.

Dr. Rommel Miranda was selected to review eight conference proposals for the 2012 Association of Science Teacher Education International Conference.

Dr. Jennifer Scott, Dr. Rommel Miranda, and Jim Reynolds facilitated a Project ASTRO workshop at the Maryland Science Center for 20 astronomer/educator partnerships, with Senior Director of Technology, IMAX & Davis Planetarium, James O'Leary, and TU faculty Dr. Tom Krause, and Dr. Alex Storrs.

Dr. Lottero-Perdue was the lead teacher for two Engineering Adventures camps – pilot programs through Engineering is Elementary not yet publicly available—at Harford Community College during August. Each camp was 12.5 instructional hours. The first camp, *Hop to It! Safe Removal of an Invasive Species*, was taught to 22 early elementary students (in 1st, 2nd, and 3rd grades). Her co-teacher camp assistants were Nicole Oakley (EERE major), Anna Hagan (EERE graduate and 4th grade teacher at Red Pump Elementary School), and Erin Grippi (EERE graduate and special education teacher at Red Pump Elementary School). The second camp, *Bubble Business: Investigating Bubbles and Designing Bubble Machines*, was taught to 15 3rd, 4th, and 5th graders. Camp co-teacher assistants for the second camp were: Becky Knight (ELED graduate and 3rd Grade teacher at Church Creek Elementary), Shawna Maxey (EERE senior, Harford County Cohort) and Jamie Schaller (EERE senior, Harford County Cohort).

Dr. Lottero-Perdue was an invited panelist for the Project Lead the Way Engineering Design and Development final project presentations at UMBC, July 13.

During the summer, Dr. Lottero-Perdue integrated/wrote two 5th grade units for the SySTEMic Project in Harford County: *Electricity, Electrical Engineering, and Electromagnetism* (4E) and *Physics and Literacy* (PAL). The 4E unit is a blend of science activities written and modified by Dr. Lottero-Perdue, as well as Engineering is Elementary lessons. PAL is a five-lesson sequence of science-literacy integrated activities written and modified by Dr. Lottero-Perdue that attend to both Maryland Science Curriculum standards and Maryland Common Core Reading standards.

On August 22 and 23, Dr. Lottero-Perdue provided six hours of professional development to 23 5th grade teachers in HCPS to prepare them to teach the 4E unit to students during the 2011 academic year.

On August 18 and 19, Dr. Lottero-Perdue and Ms. Amy Ryan, Elementary Science Teacher Specialist for HCPS, led 6 hours of professional development (PD) to 16 1st grade, 2nd grade and enrichment SySTEMic Project Master Teachers to prepare them to provide PD to the rest of the 1st and 2nd grade teachers in HCPS. As a result, Master Teachers will help prepare all 1st grade teachers to teach the *States of Matter & Chemical Engineering* unit, and all 2nd grade teachers to teach the *Pollination Partners & Agricultural Engineering* unit.

Raj Kolagani mentored the summer research program of Ms. Louise Mroczak (Physics Teacher, Catonsville High School) under the BEST program.

Grace Yong mentored the summer research program of Mr. George Schwenke (Physics Teacher, Broadneck High School, Annapolis) under the BEST program.

Dr. Parviz Ghavamian reviewed a paper for the Astrophysical Journal.

Dr. Storrs gave planetarium shows on Aug. 19 (“News from the Moon”), Aug. 15 (Boy Scouts), July 28 (BS and BCo Police), July 19 (Youth Slam), July 15 (“Maryland Historical Astronomy”), July 14 (TU speech group), July 12 (summer school group), July 7, July 6, July 1, June 17 (“An Intergalactic Tour”), June 13, June 3, June 2, and May 16 take us back to the end of the spring semester.

Dr. Parviz Ghavamian gave a public planetarium show and telescope viewing on a recent supernova M101 on September 16.



MOLECULAR BIOLOGY, BIOCHEMISTRY BIOINFORMATICS (MB3) PROGRAM

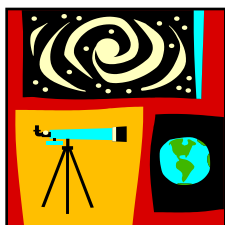
The MB3 offices underwent minor renovations over the summer. The outer office area was divided into two spaces by the addition of a new wall. One of the rooms is the administrative offices of the program. The other is space used as both a conference room and as a student study space.

There was transition in the MB3 office. The Administrative Assistant, Ms. Angela Kromm, left for a teaching position. A search was conducted to replace Angela. That search drew many highly qualified candidates. Our top choice, Ms. Natasha Walker accepted our offer and started September 8.



CENTER FOR SCIENCE AND MATHEMATICS EDUCATION

The CSME hosted sixteen science teachers from Baltimore City and Baltimore County for an eight day professional development workshop focusing on teaching the concepts of carbon, water, and biodiversity to middle and high school students. The teachers will attend five follow-up workshops on campus throughout the school year.



HACKERMAN ACADEMY OF MATHEMATICS AND SCIENCE

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 1,445 students, teachers, family members, seniors, and community leaders.

School Visits:

- 8/25 Presentation on living and working in space to 260 K-5 students at Riviera Beach Elementary School (Anne Arundel County).
- 9/8 Presentation on living and working in space to 540 K-5 students at Ring Factory Elementary School (Harford County).
- 9/8 Presentation on living and working in space to 325 K-5 students at Liberty Elementary School (Frederick County).

Additional Community Outreach:

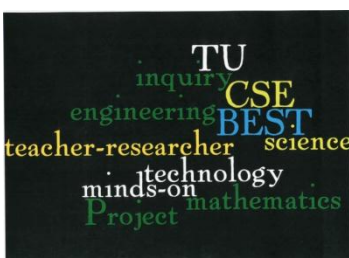
- 7/14 Presentation on living and working in space to 25 students from Baltimore Civitas School (Baltimore City) participating in a summer program at Towson University.
- 7/19 Presentation on living and working in space to 50 middle school students from across Maryland attending the MSDE Summer Center for Space Science Camp at the Applied Physics Lab.
- 7/20 Presentation on living and working in space to 20 students participating in a special program for the National Federation of the Blind held at Towson University.
- 7/22 Presentation on living and working in space to 75 7th and 8th grade girls and parents participating in the NASA Summer Institute in Science, Technology, Engineering, and Research Program held at the Goddard Space Flight Center.
- 8/17 Presentation on the Mars rovers to 25 members of the Snyder Center for Aphasia.
- 9/8 Invited Susan Slattery Memorial Lecture on achieving your dreams to 125 math and science students and faculty at Stevenson University.

Teacher Professional Development Programs

- 8/23 Presentation on achieving your dream and the importance of STEM education to 25 new math and science teachers for Harford County Public Schools.

Awards & Recognition

Don Thomas was presented a NASA Group Achievement Award on July 28, for his contributions to a newly published book titled Wings to Orbit: Scientific and Engineering Lagacies of the Space Shuttle 1971-2010.



BALTIMORE EXCELLENCE IN STEM TEACHING PROJECT (BEST)

Through a two-tiered application process, 23 teachers from 6 Maryland public school districts were selected for the 2011 BEST Project Cohort. Eight of the 23 participants teach for the Baltimore City Public Schools, eight for Baltimore County, two each for Anne Arundel, Harford, and Howard Counties, and one for Montgomery County.

Of the 23 teachers, 15 teach science, 5 teach mathematics, and 3 teach technology or engineering. This year's cohort includes 20 high school teachers and 3 middle school teachers.

During the summer of 2011, each teacher completed a 6-week authentic research experience at a Baltimore-area research institution. A list of the BEST Project teacher-interns and their respective research sites can be found on our website http://www.towson.edu/cse/best/2011-2012_teacher_interns.asp. The project Director met with each teacher-mentor pair during the summer to ensure that the research internship was progressing smoothly. Data collected from

these summer site visits and weekly electronic discussion forums indicate that teachers learned a tremendous amount during their immersion into real-world research. The overwhelming response from the teachers has been that the summer research internship was an invaluable experience, increasing their content knowledge and providing them with a first-hand understanding of how scientific and mathematical knowledge is generated. The research experience also cultivated an enthusiasm for inquiry-based learning, enabling the BEST Project teachers to better provide “hands-on minds-on” activities to their students.



On Wednesday, July 20, the BEST Project teachers met at NASA's Goddard Space Flight Center for their mid-summer meeting and workshop. Morning activities included sharing research internship progress and reviewing Outreach Activity guidelines. BEST Teachers will use their summer experiences as the foundation for the development of their Curriculum Implementation Plan, a module of lessons that translates content, skills, and career-awareness from their summer projects into engaging, real-world activities for their students.

Dr. Rommel Miranda, Assistant Professor in the TU Physics, Astronomy, and Geosciences Department and BEST Project Evaluator, gave a presentation on the salient features of scientific inquiry and the inquiry continuum. BEST Teachers analyzed lab activities in small groups, discussing strategies for how to increase the level of inquiry in order to foster more student engagement and the improvement in science process skills. Before lunch, Dr. Robert Gabrys, Director of Science Education at Goddard, congratulated the BEST Teachers on their acceptance to the program and extended an invitation for “teacher-tailored” collaboration with the Education and Public Outreach Division during the 2011-2012 school year. Information about Goddard’s educational offerings can be found at <http://education.gsfc.nasa.gov/>



2011-2012 BEST Project Teachers during their visit to the Earth Science Mission Operations Center

After lunch, the BEST Teachers attended a Science on a Sphere Presentation and toured the Earth Space Missions Operations Center and Testing and Integration Facilities. Teachers learned about the constellations of satellites that are gathering data about climate change and the tests being conducted on components of the James Webb Space Telescope, projected to launch in 2018. For more information about the ESMO and the JWST, visit <http://eos.gsfc.nasa.gov/esmo/> and <http://www.jwst.nasa.gov/>.

During the 2011-2012 school year, BEST Project teachers will complete several outreach activities designed to “build bridges” between their summer research experiences and the educational community. The summer internship is the foundation of their Curriculum Implementation Plan (CIP), a collection of lessons that translates the teachers’ enhanced content, skills, and/or career-awareness into engaging, real-world activities for their students. Through presentations to their school and school district colleagues, BEST Teachers will share how their summer research experiences have affected how they view STEM teaching and learning. Academic year workshops aim to further teachers’ pedagogical knowledge of inquiry-based learning, instructional technologies, and formative assessment strategies. These learning community meetings will also provide support to BEST teachers as they develop their CIPs and plan ways to continue collaboration with their research mentors.

On September 17, BEST Teachers presented reflections on their summer research experiences at the BEST Project Fall Research Symposium, held in Smith Hall. Project mentors, school administrators, and family members are invited to share in this celebration of learning-by-doing and the plans the BEST Teachers have for improving STEM educational opportunities for their students. Teachers’ research project summaries, including their personal and professional responses to the internship experience, are available through our teacher-intern webpage. http://www.towson.edu/cse/best/2011-2012_teacher_interns.asp



BIOSCIENCE EDUCATION AND OUTREACH PROGRAM

Towson University's Center for STEM Excellence, located in the Inner Harbor of Baltimore at the Columbus Center, houses the Bioscience Education and Outreach Program (BEOP). The BEOP serves all middle and high school science teachers in Maryland. You can read more about our programs at www.towson.edu/cse/beop.

Our team had a very busy and exciting summer. In June we held two teacher professional development workshops for Baltimore County high school teachers focusing on incorporating inquiry-based lab activities into their classroom curriculum. We also hosted the Baltimore City Governor's Academy on June 20, during which the teachers participated in our Maryland Loaner Lab training program.

In early July, we kicked off our third cohort of the ExPERT Program (**Extending Professional Experiences in Research to Teachers**). The ExPERT is an NSF-funded year-long professional development experience for Prince George's County science teachers that focuses on effective nature of science instruction in the classroom. ExPERT begins with a week of nature of science instruction and exploration in a learning community. Participants then spend the next four weeks in a research lab, allowing them to experience authentic science first-hand. Participants then continue to meet monthly throughout the following school year in their learning community as they complete action research projects designed to explore their nature of science instruction in the classroom.



Our third annual Young Science Explorer's Program (YSEP) took place the second week of July. This week-long summer camp brought 20 middle school students together to explore a variety of bioscience careers. Students spent each morning taking part in a field trip to a local bioscience company or research lab and then spent the afternoons in our SciTech student learning lab conducting their own scientific investigations.

In August, we hosted our second annual Summer Academy. Summer Academy is a two-day professional development workshop for high school science teachers. Teachers explore the role of inquiry in science education and have an opportunity to conduct their own guided-inquiry science project. Participants received two Continuing Professional Development credits for their participation in the workshop.

With the start of the 2011-2012 school year, reservations for our Maryland Loaner Lab program and SciTech Student Learning Lab are rolling in!



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 University's 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 Teacher-in-Residence. The 2011-2012 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:

<http://www.phystec.org> (national)

http://www.towson.edu/fcsm/community_engagement/PhysTEC/index.asp (local)

PhysTEC Project: Summer 2011 Activities

Drs. Hermann and Sandifer welcome back Jim Selway as the returning teacher-in-residence (TIR) for the second year of the PhysTEC project! Jim was an amazing addition to the project last year and we look forward to continuing our project efforts with his help over the next 10 months.

Different activities from Towson's PhysTEC project are highlighted each newsletter. In this edition, the summer 2011 project activities and upcoming 2011-2012 of Jim Selway, the PhysTEC TIR, are described.



**Jim Selway, 2011-2012
PhysTEC TIR**

- *Professional development for local high school teachers.* The biggest project this summer was the design and implementation of a professional development session for high school physics teachers based on the physics education research of Lillian McDermott, which uses inquiry as the method to develop the concepts of current flow in simple circuits. The activity required the design and construction of circuit board, resistor boards, and battery packs and also writing five lab activities with corresponding teacher notes. The project was presented to the Baltimore County physics teachers on August 24, and will be presented again at the MAST conference in October.
- *PhysTEC website.* The second biggest project was working on a website for students who show an interest in becoming a secondary physics teacher. The website will include sections on the positive aspects of becoming a physics teacher, why Towson University would be an excellent choice for potential teachers, scholarship information, and short video clips of students, faculty, and high school teachers.
- *Physics poster for high school classrooms.* Finishing touches were put on a physics poster prepared for high school classrooms. The poster illustrates the problem solving sequence found by physics education researcher to be most effective. Its design was the joint effort of Jim Selway, Rich Pallansch and the Design Center, and Lee Alban, a local artist who drew the cartoon figures. The posters will be given out to local high school teachers for their classrooms. It is also available in .pdf form so each student can have a personal copy. The poster was conceived as advertisement for Towson University and has the TU logo included at the bottom.

- *School liaison work.* Meetings were held with Baltimore County physics teachers and George Newberry, Baltimore County Science Coordinator, to develop more collaboration between the physics teachers and the university. Selway will attend all the planned physics study meetings for the 2011-2012 year, coordinate visits to campus by visiting high school physics groups, and proceed with the development of a solid state enrichment module for high school students.
- *Summer PhysTEC conference.* In July, Selway attended a PhySTEC Conference in Omaha, Nebraska. The agenda included discussions between outgoing TIRs and incoming TIRs, secondary education recruitment strategies, Physics Education Research (PER), and alternate teaching strategies.



ROBERT NOYCE SCHOLARSHIP PROGRAM

Preparing Tomorrow's Teachers Today!

The Robert Noyce Teacher Scholarship Program encourages STEM undergraduates (junior and seniors) and graduates to become middle and high school teachers. This program provides scholarships or stipends for students who are committed to teaching in high need school districts. In addition to financial support, the Robert Noyce Scholarship program will assist in cultivating students' personal and professional desire to become exceptional STEM educators.

We are pleased to announce our third cohort of 16 new Noyce Scholars: eleven are undergraduates and five are Masters of Art in Teaching (MAT) graduate students. This is an increase of 50% from last year.



- **Undergraduate Scholars:** Adriana Brungardt (Earth- Space Science), Rebecca Buesgens (Biology), Zachary Chandler (Physics), Paige Fost (Mathematics), Tyler Goehringer (Physics), Pamela Gschwind (Biology), Christine Kujath (Earth-Space Science), Robert Scott (Mathematics), Taharah Shaw (Biology), Katelyn Striebich (Mathematics), Sean Walker (Mathematics).
- **MAT Scholars:** Brian Eney (Physics), Rory Holderness (Physics), Kathryn Holmes (Mathematics), Molly Schaefer (Mathematics), Adam Rubin (Biology).

We are currently accepting applications for our 2012-2013 academic year. Please encourage students who are interested in becoming science or math teachers to apply for this prestigious award. We aim to produce outstanding STEM teachers and invite you to join us in achieving this goal.

Please visit <http://www.towson.edu/fcsm/Noyce/> for more information.



TOPS (Towson Opportunities in STEM)

Programming

2011 marked the third year of the TOPS Summer Experience. During the week of August 15th, twenty-one incoming freshmen got a taste of college life. This week-long, on-campus experience exposed these new Towson University students to the rigor of academic life, the challenges of living in shared spaces, and the joys of being part of a diverse community. Their introduction to their future academic experience consisted of lectures, labs, and projects prepared and delivered by Dr. Sidd Kaza (CIS), Dr. Tatyana Sorokina (MATH), Dr. Jeff Simpson (PHYS), and summer program veterans Dr. Roland Roberts (BIOL), Dr. Ellen Hondrogiannis (CHEM), and Dr. Vanessa Beauchamp (BIOL). Students completed assignments and were involved in workshops intended to refine their skills in note taking, study, test taking,

and lab writing techniques. Dr. Jane Wolfson (ENVS) created numerous career exploration activities and provided feedback on writing assignments. Laksamee Putnam (Library, Reference) introduced the program participants to research resources and the library facilities. Barry Evans (Enrollment Management) provided students with the opportunity to contemplate their personal and professional goals and facilitated a powerful closing session.



Graduates

George Nwangu, a TOPS student who transferred to the university from Baltimore Community College, our partner institution, graduated in May with a degree in Chemistry. Following graduation, George took part in a research program at UNC Chapel Hill and received three offers for post-baccalaureate study.

Research

TOPS Student, Nyshia Garcia, participated in the summer REU. A poster about her research, "Genetic Diversity and Population Structure of *Solidago sempervirens* L." by Alyssa Laird, Nyshia Garcia, Larry Wimmers and Roland P. Roberts was presented at the poster session concluding the REU. In conjunction with BEST Mentor, Dr. Raj Kolagani (PHYS) and a BEST Program Teacher-Intern, TOPS Physics Secondary Education Major Tyler Goehring participated in research that he will be able to incorporate into his future STEM instruction.