

◀ MATHEMATICAL SCIENCES ▶

2007

HIGHLIGHTS

- ◇ UNDERGRADUATE MAJOR CHRISTOFFER RENNER RECEIVED THE DEAN'S AWARD FOR ACADEMIC EXCELLENCE.
- ◇ GRADUATE STUDENTS LUKE SHORTY AND JON WIXSON WERE SELECTED AS THE OUTSTANDING GRADUATE TEACHING ASSISTANTS.
- ◇ SANDY BOWERS RECEIVED A CHAMBER OF COMMERCE/ ALUMNI ASSOCIATION AWARD FOR EXCELLENCE IN TEACHING.
- ◇ PROFESSOR MAURICE BURKE AND BECKY PARKER WERE CLS OUTSTANDING TEACHERS.
- ◇ CLS DISTINGUISHED PROFESSOR JOHN BORKOWSKI WAS A VISITING PROFESSOR AT THAMMASAT UNIVERSITY IN BANGKOK, THAILAND.
- ◇ OF 103 UNDERGRADUATE MAJORS, 4 WERE PRESIDENTIAL SCHOLARS AND 14 WERE IN THE HONORS PROGRAM.

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| Books | 2 |
| Technical Manuscripts | 3 |
| Refereed Articles | 52 |
| Presentations | 45 |
| FTE Faculty | 24.9 |
| Majors | 212 |
| Grant Expenditures | \$257,277 |

SUMMARY

TEACHING

In 2007 the Department of Mathematical Sciences again delivered about 10% of the total student credit hours at MSU. We had 103 undergraduate majors seeking a B.S. degree in one of four options (Applied Mathematics, Mathematics, Mathematics Teaching, Statistics). In addition we had 109 graduate students enrolled in programs in Mathematics, Mathematics Education, and Statistics. There were 72 M.S. students and 37 Ph.D. candidates. In 2007, the department awarded 23 Bachelor of Science degrees. Of these B.S. graduates 4 graduated with highest honors, 9 graduated with honors, and 1 completed the University Honors Program. Also awarded in 2007 were 23 Master of Science degrees and five Doctor of Philosophy degrees.

Our students have received several awards this year. Benjamin Bartle, Matthew Beamer, Kevin Rice, and Matthew Welch were Presidential Scholars. Tess Ritter was a Provost Scholar. Christoffer Renner received the College of Letters and Science Dean's Award for Academic Excellence in Science. Daniel Cornish spent a semester studying abroad at Yeditepe University in Istanbul, Turkey and Steven Harris Weiel spent a year on exchange at the University of North Carolina at Wilmington.

Luke Shorty and Jonathan Wixson were departmental Outstanding GTAs. Sandy Bowers received the Bozeman Area Chamber of Commerce and MSU Alumni Association Award for Excellence in Teaching. Professor Maurice Burke and Becky Parker were recognized as College of Letters and Science Outstanding Teachers.

RESEARCH

Faculty in the Department of Mathematical Sciences had a productive year in advancing their research programs. They worked on numerous interdisciplinary research programs involving the Air Force Office of Scientific Research (AFOSR), the Center for Biofilm Engineering (CBE), the Center for Computational Biology (CCB), the Center for Learning and Teaching in the West (CLTW), the Department of Education, the Department of Energy, the Interagency Grizzly Bear Study Team, the National Institutes of Health (NIH), the National Science Foundation (NSF), the Pacific Northwest National Laboratory (PNNL), the State of Montana Fish, Wildlife, & Parks Service, the Statistical and Applied Mathematical Sciences Institute (SAMSI), the US Geological Survey (USGS), and Yellowstone National Park. Cooperative on-campus projects involved the departments of Agricultural Economics & Economics, Animal & Range Sciences, Cell Biology & Neuroscience, Chemical Engineering, Civil Engineering, Earth Sciences, Ecology, Education, Entomology, Land Resources & Environmental Sciences, Nursing, Physics, and Psychology.

Several faculty were invited to give international lectures this year. Marcy Barge spoke at the University of Kyoto, in Kyoto, Japan; at the Centre International de Rencontres Mathématiques (CIRM) in Marseille, France; at the University of Victoria, Victoria, Canada; and at the University of Copenhagen, Copenhagen, Denmark. John Borkowski was a Visiting Professor of Statistics in the Department of Mathematics and Statistics at Thammasat University in Bangkok, Thailand and gave an address at the Conference on Statistics and Applied Statistics in Cha-am, Thailand. Tomas Gedeon spoke at the 6th International Congress for Industrial and Applied Mathematics (ICIAM) in Zurich, Switzerland and the Canadian Applied Mathematics Meeting in Banff, Canada. Lukas Geyer spoke at Oberwolfach, Germany. Isaac Klapper spoke at the Institute for Mathematical Sciences, National University of Singapore in Singapore and the 4th American Society of Microbiology Conference on Biofilms in Quebec, Canada.

Steve Cherry continued a funded research project with the US Geological Survey concerning wildlife habitat in and around Yellowstone National Park. John

Borkowski and Steve Cherry both have separate funded projects with the National Park Service involving habitat studies in Yellowstone. Steve Cherry is a member of the Interagency Grizzly Bear Study Team, the Northern Yellowstone Carnivore Working Group, and the Whitebark Pine Monitoring Working Group. Lisa Davis continued on a project in sensitivity analysis of advanced guidance systems for the Air Force Office of Scientific Research. Tomas Gedeon worked on the five-year, INBRE grant, involved with bioinformatics; continued work on a National Science Foundation grant on optimal sensor receptor arrays; and completed a NSF/NIH grant to study NCR-circuit dynamics. Isaac Klapper spent fall semester at the Statistical and Applied Mathematical Sciences Institute in the Research Triangle, North Carolina. Jennie Luebeck continued work on the Department of Education funded Creating Opportunities in Mathematics for Exemplary Teaching (COMET) project, for which she serves as the Principal Investigator. Al Parker was awarded a joint Postdoctoral Fellowship by the New Zealand Institute of Mathematics, the University of Auckland, and the University of Otago. Jim Robison-Cox continued work on a whirling disease project funded by the U.S. Fish & Wildlife Service. Curt Vogel was funded by NSF on a project involving adaptive optics scanning laser ophthalmoscopy and by the Department of Energy for a project involving Los Alamos National Laboratory.

This year five Ph.D. students graduated and many more were involved in exciting research ventures. Maurice Burke's Ph.D. student, Jon Harper, finished his degree and is now teaching in the Department of Mathematics and Statistics at Minnesota State University, in Mankato, Minnesota. Tomas Gedeon worked with a team of graduate students including Jesse Berwald, Mark Campanelli, Bree Cummins, Shaun Harker, and Kate Patterson on computational neuroscience. Joe Latulippe completed his Ph.D. under Mark Pernarowski and took a faculty position in the Department of Mathematics and Statistics at Cal Poly Pomona in Pomona, California. Linda Simonsen had two Ph.D. students finish; Rachael Welder now teaches in the Department of Mathematics and Statistics at Hunter College of the City University of New York in New York City, New York and Christine Latulippe took a faculty position in the Department of Mathematics and Statistics at Cal Poly Pomona in Pomona, California. Jarek Kwapisz worked with

graduate students Veronica Baker, Andy Bouwman, David Buhanan, and Mark Mathison on problems in dynamical systems. John Borkowski's Ph.D. student, Julia Sharp, is now on the faculty of the Department of Applied Economics and Statistics at Clemson University in Clemson, South Carolina. Maurice Burke worked with graduate students Taylor Jensen, Rejoice Mudzimir, Kim Nordby, Sarah Segal, and Raquel Vallines Mira on issues in mathematics education. Curt Vogel and his postdoc, Qiang Yang, looked into atmospheric optics as it pertains to the Thirty Meter Telescope (TMT) project.

SERVICE

The Department of Mathematical Sciences serves the local and campus community, as well as the region, state and nation, in a variety of ways. All of the faculty contribute to department and campus activities. In addition, our faculty contribute to numerous efforts to improve our state. Steve Cherry served on the General Education Council for the Commissioner of Higher Education. Ken Bowers served on the Mathematics Faculty Learning Outcomes Council, convened by the Commissioner of Higher Education. Warren Esty is on the P-20 Assessment Task Force for the Commissioner of Higher Education. For the Montana Chapter of the American Statistical Association, Sherry Heis was the Secretary/Treasurer and Mark Greenwood was the President. Jennie Luebeck was on both the Board of Directors of the Montana Council of Teachers of Mathematics and the Board of Directors of the Montana Learning Center for Mathematics and Science.

Beyond the borders of Montana, several faculty contribute to their profession in a variety of ways. Robert Boik is an Editorial Board member for *Psychological Methods*. John Borkowski is an Associate Editor for both *The American Statistician* and the *Journal of Probability and Statistical Science*. He is also on the Editorial Review Board for the *Journal of Quality Technology* and the *Thailand Statistician*. Maurice Burke is the Editor of the *Navigations Series* produced by the National Council of Teachers of Mathematics. Tomas Gedeon is an Associate Editor for both the *Rocky Mountain Journal of Mathematics* and *Discrete and Continuous Dynamical Systems*.

PUBLICATIONS

A. BOOKS / EDITED COLLECTIONS / FULL-LENGTH WORKS

ESTY, W.

Precalculus, 4th Edition, W. Esty, Pearson Publishing, 445 pages, (2007).

Proof: Introduction to Higher Mathematics, W. Esty and N. Esty, 393 pages, (2007).

B. TECHNICAL MANUSCRIPTS

CHERRY, S.

"Monitoring Whitebark Pine in the Greater Yellowstone Ecosystem," R.E. Bennetts, S. Cherry, J. Canfield, G. DeNitto, D. Reinhart, C.C. Schwartz, and E. Shanahan, in C.C. Schwartz, M.A. Haroldson, K. West (Eds), *Yellowstone Grizzly Bear Investigations: 2006 Annual Report of the Interagency Grizzly Bear Study Team*, U.S. Geological Survey, Bozeman, Montana, 44-54, (2007).

"Monitoring Ungulate Carcasses and Spawning Cutthroat Trout," S. Cherry, in C.C. Schwartz, M.A. Haroldson, K. West (Eds), *Yellowstone Grizzly Bear Investigations: 2006 Annual Report of the Interagency Grizzly Bear Study Team*, U.S. Geological Survey, Bozeman, Montana, 55-62, (2007).

GREENWOOD, M.

"Functional Linear Models for Streamflow Discharge," M. Greenwood, J. Moore, and J. Harper, *Proceedings of The American Statistical Association, Section on Statistics and the Environment*, CD-ROM 2384-2390, (2007).

C. REFEREED PUBLICATIONS

BARGE, M.

"Proximity in Pisot Tiling Spaces" M. Barge and B. Diamond, *Fundamenta Mathematica*, 194, 191-238, (2007).

"Rigidity in One Dimensional Substitution Tiling Spaces" M. Barge and R. Swanson, *Topology and Its Applications*, 154(17), 3095-3099, (2007).

"New Techniques for Classifying Williams Solenoids", M. Barge and R. Swanson, *Tokyo Journal of Mathematics*, 30 (1), 139-157, (2007).

BOIK, R.

“Accurate Confidence Intervals in Regression Analysis,” R. Boik, *Annals of the Institute of Statistical Mathematics* doi:10.1007/s10463-006-0085-1, (2007).

“An Implicit Function Approach to Constrained Optimization with Applications to Asymptotics,” R. Boik, *Journal of Multivariate Analysis*, doi:10.1016/j.jmva.2007.01.005, (2007).

BORKOWSKI, J.

“Inferring Protein Associations Using Protein Pull-down Assays,” J.L. Sharp, K.K. Anderson, D.S. Daly, D.L. Auberry, J.J. Borkowski, and W.R. Cannon, *2006 Proceedings of the American Statistical Association, Biometrics Section*, 365-369, (2007).

“New Variance Dispersion Graphs for Mixture Experiments,” J.J. Borkowski, *Proceedings of the 2007 Conference on Statistics and Applied Statistics*, Cha-am, Thailand, 9-20, (2007).

“Restoring Species Richness and Diversity in a Russian Knapweed (*Acroptilon Repens*)-Infested Riparian Plant Community Using Herbicides,” R.L. Sheley, S.M. Laufenberg, J.S. Jacobs, and J.J. Borkowski, *Weed Science*, 55, 311-318, (2007).

BURKE, M.

“Using Technology to Optimize and Generalize: The Least Squares Line,” M. Burke and T. Hodgson, *Mathematics Teacher/ National Council of Teachers of Mathematics*, 101(2), (2007).

“Introductory Algebra Chapter,” D. Resek, A. Branch, S. Brown, M. Burke, K. Koedinger, J. Mayer, M. Mitchell, K. Mowers, P. Shure, in Victor J. Katz (Ed.), *Algebra: Gateway to a Technological Future*, (2007).

BURROUGHS, E.

“PMET Grant Report: A Specialized Course for Mathematics Education Majors, Preparing Mathematicians to Educate Teachers” E. Burroughs and S. Brown, *Mathematical Association of America*, <http://www.maa.org/pmet/papers.html>, (2007).

“Encouraging Pre-Service Teachers as Mathematicians,” E. Burroughs, *Mathematics Teacher/ National Council of Teachers of Mathematics*, 100(7), 464-469, (2007).

CHERRY, S.

“Evaluating Estimators of the Numbers of Females with Cubs-of-the-Year in the Yellowstone Grizzly Bear Population,” S. Cherry, G.C. White, K.A. Keating, M.A. Haroldson, and C.C. Schwartz, *Journal of Agricultural, Biological and Environmental Statistics*, 12, 195-215, (2007).

CUMMINS, B.

“Interaction Between Arthropod Filiform Hairs in a Fluid Environment,” B. Cummins, T. Gedeon, I. Klapper, and R. Cortez, *Journal of Theoretical Biology*, 247, 266-280, (2007).

DOCKERY, J.

“Senescence Can Explain Microbial Persistence,” I. Klapper, P. Gilbert, B.P. Ayati, J. Dockery, and P. Stewart, *Microbiology*, 153, 3623-3630, (2007).

GEDEON, T.

“Topological Horseshoes of Travelling Waves for Fast-Slow Predator-Prey System,” M. Gameiro, T. Gedeon, W. Kallies, H. Kokubu, K. Mischaikow, and H. Oka, *Journal of Dynamics and Differential Equations*, 19, 623-654, (2007).

“Interaction Between Arthropod Filiform Hairs in a Fluid Environment,” B. Cummins, T. Gedeon, I. Klapper, and R. Cortez, *Journal of Theoretical Biology*, 247, 266-280, (2007).

“Dynamics of a Simple Regulatory Switch,” E. Boczko, T. Gedeon, and K. Mischaikow, *Journal of Mathematical Biology*, 55, (2007).

“Oscillation in Multi-Stable Monotone System with Slowly Varying Positive Feedback,” T. Gedeon and E. Sontag, *Journal of Differential Equations*, 239, 273-295, (2007).

“A Multilinear Optimization Problem Associated with Correspondence Maximization,” S. Harker, C.R. Vogel, and T. Gedeon, *Journal of Mathematical Imaging and Vision*, 29, 49-62, (2007).

“Genericity of the Fixed Point Set for the Infinite Population Genetic Algorithm,” T. Gedeon, C. Hayes, and R. Swanson, *Foundations of Genetic Algorithms*, Springer-Verlag, LCNS No. 4436, 97-109, (2007).

GEYER, L.

"Type Problem for Riemann Surfaces," L. Geyer, *Oberwolfach Report 9/2007*, 504, (2007).

GREENWOOD, M.

Book Review, M. Greenwood. "Nonparametric Functional Data Analysis: Theory and Practice" by F. Ferraty and P. Vieu, *Journal of the American Statistical Association*, 102(479), 1077, (2007).

"Significance of Trends Toward Earlier Snowmelt Runoff, Columbia and Missouri Basin Headwaters, Western United States," J. Moore, J. Harper, and M. Greenwood, *Geophysical Research Letters*, 34, 1-5, (2007).

HAMILTON, M.

"Comparative Evaluation of Biofilm Disinfectant Efficacy Tests," K. Buckingham-Meyer, D.M. Goeres, and M.A. Hamilton, *Journal of Microbiological Methods*, 70, 236-244, (2007).

"Comparative Evaluation of Two Quantitative Test Methods for Determining the Efficacy of Liquid Sporicides on a Hard Surface: A Pre-collaborative Study," S.F. Tomasino and M.A. Hamilton, *Journal AOAC International*, 90(2), 456-464, (2007).

"Asiatic Acid and Corosolic Acid Enhance the Susceptibility of *P. aeruginosa* Biofilms to Tobramycin," E. Garo, G.R. Eldridge, M.G. Goering, E.D. Pulcini, M.A. Hamilton, J.W. Costerton, and G.A. James, *Antimicrobial Agents and Chemotherapy*, 51(5), 1813-1817, (2007).

"A Laboratory Hot Tub Model for Disinfectant Efficacy Evaluation," D.M. Goeres, L.R. Loetterle, and M.A. Hamilton, *Journal of Microbiological Methods*, 68, 184-192, (2007).

HARKER, S.

"A Multilinear Optimization Problem Associated with Correspondence Maximization," S. Harker, C.R. Vogel, and T. Gedeon, *Journal of Mathematical Imaging and Vision*, 29, 49-62, (2007).

HAYES, C.

"Genericity of the Fixed Point Set for the Infinite Population Genetic Algorithm," T. Gedeon, C. Hayes, and R. Swanson, *Foundations of Genetic Algorithms*, Springer-Verlag, LCNS No. 4436, 97-109, (2007).

HODGSON, T.

"Using Technology to Optimize and Generalize: The Least Squares Line," M. Burke and T. Hodgson, *Mathematics Teacher/ National Council of Teachers of Mathematics*, 101(2), (2007).

KLAPPER, I.

"Description of Mechanical Response Including Detachment Using a Novel Particle Model of Biofilm/ Flow Interaction," E. Alpkvist, and I. Klapper, *Water Science Technology*, 55, 265-273, (2007).

"A New Multidimensional Multispecies Continuum Model for Heterogeneous Biofilm Development," E. Alpkvist and I. Klapper, *Bulletin of Mathematical Biology*, 69, 765-789, (2007).

"A Multiscale Model of Biofilm as a Senescence-Structured Fluid," B.P. Ayati, and I. Klapper, *Multiscale Modeling and Simulation*, 6, 347-365, (2007).

"Senescence Can Explain Microbial Persistence," I. Klapper, P. Gilbert, B.P. Ayati, J. Dockery, and P. Stewart, *Microbiology*, 153, 3623-3630, (2007).

"Interaction Between Arthropod Filiform Hairs in a Fluid Environment," B. Cummins, T. Gedeon, I. Klapper, and R. Cortez, *Journal of Theoretical Biology*, 247, 266-280, (2007).

"A Large Jump Asymptotic Framework for Solving Elliptic and Parabolic Equations with Interfaces and Strong Coefficient Discontinuities," I. Klapper and T. Shaw, *Applied Numerical Mathematics*, 57, 657-671, (2007).

"Reciprocity Relations Between Stokes Flows and Viscoelastic Fluids," K. Xu, M.G. Forest, and I. Klapper, *Journal of Non-Newtonian Fluid Mechanics*, 145, 150-172, (2007).

KWAPISZ, J.

"A Toral Flow with a Pointwise Rotation Set that is Not Closed," J. Kwapisz, *Nonlinearity*, 20, 2047-2060, (2007).

LUEBECK, J.

"Online Paired Mentoring of Rural Science and Mathematics Teachers," L. Simonsen, J. Luebeck, and L. Bice, *Proceedings of the AACE World Conference On Educational Multimedia, Hypermedia & Telecommunications*, 2458-2465, (2007).

ROBISON-COX, J.

“Simulating Gender Stratification,” J. Robison-Cox, R.F. Martell, and C.G. Emrich, *Journal of Artificial Societies and Social Simulation*, 10(3), <http://jasss.soc.surrey.ac.uk/10/3/8.html>, (2007).

SHARP, J.L.

“Inferring Protein Associations Using Protein Pull-down Assays,” J.L. Sharp, K.K. Anderson, D.S. Daly, D.L. Auberry, J.J. Borkowski, and W.R. Cannon, *2006 Proceedings of the American Statistical Association, Biometrics Section*, 365-369, (2007).

“Statistically Inferring Protein-Protein Associations With Affinity Isolation LC-MS/MS assays,” J.L. Sharp, K.K. Anderson, G.B. Hurst, D.S. Daly, D.A. Pelletier, W.R. Cannon, D.L. Auberry, D.D. Schmoyer, W.H. McDonald, A.M. White, B.S. Hooker, K.D. Victry, M.V. Buchanan, V. Kery, and H.S. Wiley, *Journal of Proteome Research*, 6(9), 3788-3796, (2007).

SWANSON, R.

“Rigidity in One Dimensional Substitution Tiling Spaces” M. Barge and R. Swanson, *Topology and Its Applications*, 154(17), 3095-3099, (2007).

“New Techniques for Classifying Williams Solenoids”, M. Barge and R. Swanson, *Tokyo Journal of Mathematics*, 30(1), 139-157, (2007).

“Genericity of the Fixed Point Set for the Infinite Population Genetic Algorithm,” T. Gedeon, C. Hayes, and R. Swanson, *Foundations of Genetic Algorithms*, Springer-Verlag, LCNS No. 4436, 97-109, (2007) .

VOGEL, C.

“Mapping LGN Receptive Fields by Single Cone Stimulation with Adaptive Optics Scanning Laser Ophthalmoscopy,” L. Sincich, Y. Zhang, P. Tiruveedhula, D. Adams, Q. Yang, C. Vogel, D. Arathorn, J. Horton, and A. Roorda, *Society for Neuroscience*, 228(5), (2007).

“Retinally Stabilized Cone-Targeted Stimulus Delivery,” D. Arathorn, Q. Yang, C. Vogel, Y. Zhang, P. Tiruveedhula, and A. Roorda, *Optics Express/Optical Society of America*, 15, 13731-13744, (2007).

“A Multilinear Optimization Problem Associated with Correspondence Maximization,” S. Harker, C.R Vogel,

and T. Gedeon, *Journal of Mathematical Imaging and Vision*, 29, 49-62, (2007).

YANG, Q.

“Mapping LGN Receptive Fields by Single Cone Stimulation With Adaptive Optics Scanning Laser Ophthalmoscopy,” L. Sincich, Y. Zhang, P. Tiruveedhula, D. Adams, Q. Yang, C. Vogel, D. Arathorn, J. Horton, and A. Roorda, *Society for Neuroscience*, 228(5), (2007).

“Retinally Stabilized Cone-Targeted Stimulus Delivery,” D. Arathorn, Q. Yang, C. Vogel, Y. Zhang, P. Tiruveedhula, and A. Roorda, *Optics Express/Optical Society of America*, 15, 13731-13744, (2007).

YOPP, D.

“A Yin and Yang Approach to Area and Irregular Shapes: Beyond the Area of Triangles and Parallelograms,” D. Yopp and Z. Jinyan, *Mathematics Teaching in the Middle School, NCTM*, 13, 296-297, (2007) .

PRESENTATIONS

BARGE, M.

“Cohomology of Tiling Spaces I: Spectral Analysis of Aperiodic Systems and Related Topics,” University of Kyoto, Kyoto, Japan, 2007.

“Cohomology of Tiling Spaces II: Dynamic Systems and Related Topics,” University of Kyoto, Kyoto, Japan, 2007.

“The Branch Locus, Aperiodic Order,” Centre International de Rencontres Mathematiques (CIRM), Marseille, France, 2007.

“Rigidity in One-Dimensional Substitution Tiling Spaces,” AMS Special Session, Charlotte, North Carolina, 2007.

“The Branch Locus in One-Dimensional Substitution Tiling Spaces,” University of Victoria, Victoria, British Columbia, Canada, June 2007.

“Geometry and Topology of Quasicrystals,” University of Copenhagen, Copenhagen, Denmark, May 2007.

BORKOWSKI, J.

“Componentwise Variance Dispersion Graphs for Mixture Experiments,” Annual Meeting of the Montana Chapter of the American Statistical Association, Butte, Montana, September 2007.

“New Variance Dispersion Graphs for Mixture Experiments,” Conference on Statistics and Applied Statistics, Cha-am, Thailand, May 2007.

“Componentwise Variance Dispersion Graphs for Mixture Experiments,” Joint Statistical Meetings, Salt Lake City, Utah, July 2007.

“Statistics and Public Perception,” Bozeman, Montana, March 2007.

BURKE, M.

“Online Delivery of Doctoral Courses,” with V. Long, National Conference on Doctoral Programs in Mathematics Education, Kansas City, Missouri, 2007.

“Teaching to the Test Without Teaching to the Test,” Montana Education Association/Montana Federation of Teachers Conference, Belgrade, Montana, October 2007.

“Approximately Speaking,” Teachers Teaching with Technology Conference,” Helena, Montana, 2007.

BURROUGHS, E.

“Poster Projects: Mathematics in Context,” with Sharon Brown, MAA Mathfest, San Jose, California, August 2007.

CHERRY, S.

“Behavioral Responses of Elk to Wolves: Consequences of Living in a Risky Environment,” with C.N. Gower, R.A. Garrott, P.J. White, and N.G. Yoccoz, 6th Western States and Provinces Deer and Elk Workshop, Presenter: C. Gower, Estes Park, Colorado, 2007.

“Behavioral Responses of Elk to Wolves: Consequences of Living in a Risky Environment,” with C.N. Gower, R.A. Garrott, P.J. White, and N.G. Yoccoz, Montana State Chapter of the Wildlife Society, Presenter: C. Gower, Bozeman, Montana, 2007.

DOCKERY, J.

“Cohesion Biofilm Model,” Biofilm Mechanics

Workshop, Bozeman, Montana, June 2007.

ESTY, W.

“The Language of Mathematics”, Academy for Teacher Excellence of University of Texas San Antonio, San Antonio, Texas, 2007.

GEDEON, T.

“Fluid-Structure Interaction in Crickets,” University of Nebraska, Lincoln, Nebraska, 2007.

“Optimality of Cercal Sensory System,” National CRCNS PI Meeting, Washington DC, 2007.

“Why is Lambda Phage So Stable?,” Mathematical Biosciences Institute, Ohio State University, Columbus, Ohio, 2007.

“Non-Monotonicity in Gene Regulation,” Mathematical Biology Seminar, Rutgers University, New Jersey, 2007.

“Modeling Arthropod Hairs Using Immersed Boundary Method,” American Society of Mechanical Engineers (ASME) International Congress, Seattle, Washington, November 2007.

“When Activators Repress and Repressors Activate,” with K. Patterson, Systems Biology Annual Conference, Long Beach, California, 2007.

“NCR Circuit Dynamics,” International Congress for Industrial and Applied Mathematics (ICIAM) 2007, Zurich, Switzerland, July 2007.

“How to Model Transcription Networks,” Annual Canadian Applied and Industrial Mathematics Meeting, Banff, Canada, May 2007.

GEYER, L.

“Type problem for Riemann Surfaces, Normal Families and Complex Dynamics,” Oberwolfach, Germany, February 2007.

GREENWOOD, M.

“Spatial Analysis of Drumlin Orientations,” with C. Gilstrap and K. Norton, American Geophysical Union Fall Meeting, San Francisco, California, December 2007.

“Yearly Streamflow Discharge Analysis Using Functional Regression Models,” with J. Harper and J. Moore, American Geophysical Union Fall Meeting, San Francisco, California, December 2007.

“Comparing Least Squares and Robust Methods in Linear Regression Analysis of the Discharge of the Flathead River, Northwestern Montana,” with A. Bell and J. Moore, American Geophysical Union Fall Meeting, San Francisco, California, December 2007.

“Functional Linear Models for Daily and Yearly Streamflow Measures,” with J. Harper and J. Moore, Joint Statistical Meetings, Salt Lake City, Utah, August 2007.

“Parametric, Nonparametric, and Semi-parametric Models for Yearly Streamflow Runoff Measures,” Department of Physics Colloquium, Montana State University, Bozeman, Montana, April 2007.

HAYES, C.

“The Infinite Population Genetic Algorithm: A Dynamical System with Generic Properties,” SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, May 2007.

“Genericity of the Fixed Point Set for the Infinite Population Genetic Algorithm,” Foundations of Genetic Algorithms IX, Mexico City, Mexico, 2007.

KLAPPER, I.

“Biofilms and Microbial Mats: Multiphase Physical-Biological Systems,” Workshop on Multiphase Physical Flows and Applications, Institute for Mathematical Sciences, National University of Singapore, Singapore, 2007.

“Modeling Biofilms as Viscoelastic Materials,” 4th American Society of Microbiology Conference on Biofilms, Quebec, Canada, March 2007.

“Measuring Material Properties of Biofilms,” Institute for Pure and Applied Mathematics (IPAM) Reunion Conference, Lake Arrowhead, California, 2007.

“A Computational Biofilm Rheometer,” Biofilm Mechanics Workshop, Montana State University, Bozeman, Montana, June 2007.

“A Multiscale Model of Biofilm as a Senescence-Structured Fluid,” with B. Ayati, 4th American Society of Microbiology Conference on Biofilms, Quebec, Canada, March 2007.

“A Physical View of Microbial Colony Structure,” Conference on Frontiers in Applied and Computational

Mathematics, New Jersey Institute of Technology, Newark, New Jersey, 2007.

“Effective Properties of Heterogeneous Materials,” Statistical and Applied Mathematical Sciences Institute (SAMSI), Research Triangle, North Carolina, October 2007.

LUEBECK, J.

“Measuring Mathematical Power: Methods for Evaluating Teacher Change,” Association of Mathematics Teacher Educators Eleventh Annual Conference, Irvine, California, January 2007.

VOGEL, C.

“Inverse Problems in Vision” (3-part lecture series), Graduate Student Workshop on Inverse Problems, Colorado State University, Fort Collins, Colorado, 2007.

“Results on Object of Interest Identification,” Los Alamos National Laboratory Data Driven Modeling and Analysis (DDMA) Radiography Project Meeting, Boulder, Colorado, 2007.

“Biologically Motivated Methods for Inverse Problems in Vision,” Sandia National Laboratory Computer Science Research Institute (CSRI) Workshop on Large-Scale Inverse Problems and Quantification of Uncertainty, Santa Fe, New Mexico, 2007.

GRANTS

A. FUNDED EXTERNAL GRANTS

BORKOWSKI, J.

“Evaluating Wildlife Responses to Winter Human Use in Yellowstone National Park,” National Park Service, PI: J.J. Borkowski, \$10,000, (2006-2007).

“Harvest Survey Sampling and Estimation,” Montana Department of Fish, Wildlife, and Parks, PI: J.J. Borkowski, \$49,936 (2007-2009).

“Evaluating Wildlife Responses to Winter Human Use in Yellowstone National Park,” National Park Service, PI: J.J. Borkowski, \$10,000, (2007-2008).

BURKE, M.

“Before It’s Too Late III,” Office of the Commissioner

of Higher Education, PI: D. Erikson, co-PI: M. Burke, \$40,000, (2007).

CHERRY, S.

“Statistical Support for Analysis and Design of Vital Signs Monitoring within the Greater Yellowstone Inventory and Monitoring Network,” US Department of Interior - National Park Service, PI: S. Cherry, co-PI: R. Bennetts, \$20,125, (2004-2007).

DAVIS, L.

“Sensitivity Analysis and Computation for Partial Differential Equations,” Air Force Office of Scientific Research (AFOSR), PI: L. Davis, \$14,427, (2007).

GEDEON, T.

“Optimality of a Sensory Receptor Array,” NSF, PI: T. Gedeon, co-PI: J. Miller and G. Jacobs, \$599,634, (2005-2008).

“Collaborative Proposal: NCR-Circuit Dynamics,” NSF/NIH, PI: T. Gedeon, co-PI: E. Boczeko, K. Mischaikow, T. Cooper, \$157,263, (2005-2008).

HODGSON, T.

“Gallatin to Glacier: Middle Grades Mathematics/G2G,” U.S. Department of Education, PI: J. Luebeck, co-PI: J. Howard and T. Hodgson, \$332,000, (2006-2008).

KLAPPER, I.

“Statistical and Applied Mathematical Sciences Institute (SAMSI) Visiting Scientist,” NSF, PI: I. Klapper, \$26,675, (2007).

LUEBECK, J.

“Gallatin to Glacier: Middle Grades Mathematics/G2G,” U.S. Department of Education, PI: J. Luebeck, co-PI: J. Howard and T. Hodgson, \$332,000, (2006-2008).

“Year One Continuation of Creating Opportunities in Mathematics for Exemplary Teaching (COMET),” U.S. Department of Education, PI: J. Luebeck, co-PI: J. Howard, \$75,000, (2006-2007).

“Year Two Continuation of Creating Opportunities in Mathematics for Exemplary Teaching (COMET),” U.S. Department of Education, PI: J. Luebeck, co-PI: J. Howard, \$75,000, (2007-2008).

ROBISON-COX, J.

“An Ecological Assessment of Large-Scale Spatial and Temporal Patterns of Whirling Disease Risk and Salmonid Populations,” co-PI: B. Kerens, T. McMahon, J. Robison-Cox, U.S. Fish & Wildlife Service, (2006-2008).

VOGEL, C.

“Prescribed Stimulus Delivery Capability and Stabilized Video Presentation for Adaptive Optics Scanning Laser Ophthalmoscope,” NSF Center for Adaptive Optics, PI: D. Arathorn, co-PI: C. Vogel, \$100,000, (2007-2008).

“Research and Development in Data Driven Modeling and Analysis,” Department of Energy, PI: C. Vogel, \$92,661, (2006-2007).

B. FUNDED INTERNAL GRANTS

BORKOWSKI J.

“Conducting Collaborative Research with Statistics Faculty at Kasetsart University and Silpakorn University, Thailand,” Short-Term Faculty Professional Development Leave Program, PI: J. Borkowski, \$3,600, (2007).

“Establishing Collaborative Research with Faculty and Doctoral Students at Thammasat University in Thailand and to Enhance Recruitment of Doctoral Students for our Graduate Program,” Faculty International Research and Development Program, PI: J. Borkowski, \$1,500, (2007).

GEDEON, T.

“Speaker Award-J. Keener,” CLS Research Enhancement Award, PI: T. Gedeon, Co-PI: J. Dockery, \$1,245, (2007).

“International Conference on Mathematical Tools for Multi-Scale Biological Processes,” CLS Research Enhancement Award, PI: T. Gedeon, \$1,000, (2007).

KLAPPER, I.

“Travel funds for American Society for Microbiology (ASM) Conference on Biofilms,” CLS Research Enhancement Award, PI: I. Klapper, \$1,925, (2007).