Undergraduate major Erik Wheeler was one of only seven students inducted into Septemviri and Charlie Doughty was one of only three senior men at MSU given the Max Worthington Award. Erik Aver was one of only eight students to graduate with a perfect 4.0 GPA.

Graduate student Kevin Flanagan was selected as the Outstanding Graduate Teaching Assistant in the College of Letters of Science.

Alumna Susan Hinkins (Ph.D. 1979) was named a Fellow of the American Statistical Association.

Professor John Borkowski was on sabbatical working with scientists in Yellowstone National Park.

Of 120 undergraduate majors, 5 were Presidential Scholars and 24 were in the Honors Program.

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### Highlights

<table>
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<td>Book Chapters</td>
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<td>Refereed Articles</td>
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<td>FTE Faculty</td>
<td>25.6</td>
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<td>Majors</td>
<td>212</td>
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<tr>
<td>Grant Expenditures</td>
<td>$633,895</td>
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### Summary

**TEACHING**

The Department of Mathematical Sciences delivered about 10% of the total student credit hours at MSU last year. We have 120 undergraduate majors seeking a B.S. degree in one of four options (Applied Mathematics, Mathematics, Mathematics Teaching, Statistics). In addition we have 63 M.S. students and 29 Ph.D. candidates. At the 2004 commencement exercises, the department awarded 22 Bachelor of Science degrees. Among our graduates were three students who graduated with highest honors, seven who graduated with honors, and three who completed the University Honors Program. Also awarded were 22 Master of Science degrees, one Doctor of Philosophy degree, and one Doctor of Education degree.

Our students have received several awards this year. Benjamin Bartle, John Cross, Charlie Doughty, Kori Smith, and Matthew Welch were Presidential Scholars. Erik Wheeler joined Charlie Doughty as a member of both Mortar Board and Septemviri. Cheryl Hitzeroth was one of twelve students to receive a Student of Achievement Award. Charlie Doughty received the Max Worthington Award. Sarah Jensen was one of the first MSU interns for Advanced Acoustics Concepts, Inc. Seth Timpano was MSU Rotary Students of the Month for April. Charlie Doughty was chair of the ASMSU Lively Arts and Lectures Series. Kevin Flanagan was selected as the Outstanding GTA in the College of Letters of Science, the second year in a row that this award went to a GTA in our department.

**RESEARCH**

Faculty in the Department of Mathematical Sciences have had a productive year in advancing their research programs. Our faculty are working on numerous interdisciplinary research programs involving
the Air Force Office of Scientific Research (AFOSR), the Biological Information Technology and Systems (BITS) grant, the Center for Biofilm Engineering (CBE), the Center for Computational Biology (CCB), the Center for Learning and Teaching in the West (CLTW), the Interagency Grizzly Bear Study Team, the Pacific Northwest National Laboratory (PNNL), the Solar Physics Group, the Systemic Initiative in Montana Mathematics and Science (SIMMS), the US Geological Survey (USGS), Yellowstone National Park, and the Western Transportation Institute (WTI). Cooperative on-campus projects involved the departments of 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. Jarrett Barber spoke in Toronto, Canada. John Borkowski spoke in both Toronto and Victoria, Canada. Tomas Gedeon was invited to Kamakura, Japan and also spoke on two different occasions at the Banff International Research Station in Banff, Canada. Jarek Kwapisz spoke at the University of Gdansk, Gdansk, Poland; the Mathematics Institute of the Polish Academy of Sciences, in Warsaw, Poland; the Max Planck Institute in Bonn, Germany; and the Banff International Research Station in Banff, Canada. Jennie Luebeck was invited to speak in the Bahamas while Curt Vogel gave talks in Glasgow, Scotland and at the Banff International Research Station in Banff, Canada. Of more local interest, both John Borkowski and Steve Cherry, continue separate funded research projects with the US Geological Survey concerning wildlife habitat in and around Yellowstone National Park. Each also has separate funded projects with the National Park Service involving habitat studies in Yellowstone. John Borkowski received a faculty fellowship from the Pacific Northwest National Laboratory and a sabbatical to participate in the Sabbatical in the Parks program in Yellowstone. Maurice Burke is nearing completion as the editor of four books in the Navigations Series for the National Council of Teachers of Mathematics.

Tomas Gedeon has begun work on the five-year, $18,000,000 INBRE grant, involved with bioinformatics. Ted Hodgson spent a semester at Indiana University working on the Mathematics Through the Curriculum Project. Jennie Luebeck began work on the DOE-funded Creating Opportunities in Mathematics for Exemplary Teaching (COMET) project, for which she serves as the Evaluation Director. Jim Robison-Cox continues his work on an NSF-funded study into bias and exclusion. Lisa Stanley and Curt Vogel continue their work on separate large Air Force funded projects. Finally, Curt Vogel filed for a joint patent on the map-seeking algorithm for dewarping movement-induced blur between time-separated images.

This year, Robert Boik’s Ph.D. student, Scott Hyde, finished his degree and is now an Assistant Professor of Mathematics in the Department of Mathematics at BYU-Hawaii, in Laie, Hawaii. Jennifer Kosiak finished her Ph.D. under Linda Simonsen and is now an Assistant Professor in the Mathematics Department at the University of Wisconsin-LaCrosse, in LaCrosse, Wisconsin. Lisa Stanley directed a team involving postdoc, Faranak Pahlevani, and graduate students, Michael Larkin and Mike Bowman, that investigated unmanned air vehicles. Curt Vogel, his postdoc, Qing Yang, and graduate student, Jennifer Thorenson, looked into atmospheric optics and the use of giant telescopes.

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. Maurice Burke is on the Mathematics Standards Review Committee, convened by the Superintendent of Public Instruction. Warren Esty is on the Mathematics Proficiency Steering Committee, convened by the Commissioner of Higher Education. For the Montana Chapter of the American Statistical Association, Sherry Heis was the Secretary/Treasurer and John Borkowski was the Chapter Representative. Linda Simonsen was on the Board of Directors of the Montana Council of Teachers of Mathematics.

Beyond the borders of Montana, several faculty contribute to their profession in a variety of ways. Lyle
Andersen is on the National Advisory Committee for the Big Sky Institute for Science and Natural History. Robert Boik is an Editorial Board member for Psychological Methods. John Borkowski is an Associate Editor for The American Statistician and the Journal of Probability and Statistical Science. Maurice Burke is on the National Advisory Board for the SIMMS-IM Dissemination Grant. Ted Hodgson served on an NSF-CCLI review panel and as a curriculum consultant for the Carnegie Learning Corporation. Linda Simonsen is the editor of Connecting Research to Teaching for the Mathematics Teacher and served on the Advisory Board for the Metro Math NSF Center in Philadelphia.

A. BOOKS / EDITED COLLECTIONS / FULL-LENGTH WORKS

BOWERS, S.


ESTY, W.


POHL, M.


SOJDA, M.


THOMPSON, S.


B. BOOK CHAPTERS

BOIK, R.


CHERRY, S.


SHARP, J.M.


C. REFEREED JOURNAL PIECES

ANDERSEN, L.


BOIK, R.


BORKOWSKI, J.


BOWERS, K.


CHERRY, S.


ESTY, W.

GEDEON, T.


GREENWOOD, M.
“Formulary Conversion from Doxazosin to Terazosin for the Treatment of Benign Prostatic Hyperplasia in a Small Veterans Hospital,” W. Yamreudeewong, D. McPeak, and M. Greenwood, Hospital Pharmacy, 39, 47-51, (2004).

HAMILTON, M.


HODGSON, T.


KLAPPER, I.


KWAPISZ, J.
“Transfer Operator, Topological Entropy and Maximal

PARKER, A.


ROBISON-COX, J.


SHARP, J. M.


SHAW, T.


STANLEY, L.


VOGEL, C.


**PRESENTATIONS**

BARBER, J.


BARGE, M.


BORKOWSKI, J.


BURKE, M.


CHERRY, S.


DOCKERY, J.


ESTY, W.


GEDEON, T.


“Dynamics of the NCR-Circuit,” Workshop on Quantitative Mathematical Modeling of Gene Regulatory Networks, Mathematical Biosciences Institute, The Ohio State University, Columbus, Ohio, December 2004.


HAMILTON, M.


“Parallel Testing to Determine the Influence of Biofilm Growth Conditions on Antimicrobial Log Reduction:


HASENBANK, J.
“Homework, Quizzes, and Student Motivation,” Northern Rocky Mountain Educational Research Association (NRMERA) 22nd Annual Conference, Custer, South Dakota, October 2004.

HITZEROOTH, C.

HODGSON, T.


KLAPPER, I.
“Some Problems in Mathematical Biology,” Department of Mathematics, Tulane University, New Orleans, Louisiana, April 2004.


KOSIAK, J.


KWAPISZ, J.


“Geometric Coincidence Conjecture for Tiling Spaces of Unimodular Pisot Substitutions,” Algebraic and Topological Dynamics Seminar, Max-Planck-Institut, Bonn, Germany, June 2004.

LATULIPPE, C.


LUEBECK, J.


PAHLEVANI, F.


PARKER, A.

“Tracking Eye Motion from Retinal Scan Data with a Map Seeking Circuit,” Controlling Eye Movements Session, Center for Adaptive Optics Fall Retreat, Lake Arrowhead, California, November 2004.

SHARP, J. L.


SHAW, T.


SIEGFRIED, E.


SIMONSEN, L.


SMITH, M.


STANLEY, L.


TIMPANO, S.


VOGEL, C.

“Estimating Object Motion from Scanned Image Data,”


“Tracking Eye Motion From Retinal Scan Data,” Workshop on Mathematical Image Analysis and Processing, Banff International Research Station, Banff, Alberta, Canada, October 2004.

YANG, Q.


“Adaptive Optics for Astronomical Telescopes,” Department of Physics, Montana State University, Bozeman, Montana, September 2004.


BORKOWSKI, J.


CHERRY, S.


DOCKERY, J.


GEDEON, T.


“Montana Institutional Development Award (IDeA) Network of Biological Research Excellence (INBRE),” NIH-NICRR (National Center for Research Resources), PI: Tim Ford, co-PI: Tomas Gedeon, Allen Harmsen, Brendan Mumey, Adele Pittendrigh, Martin Tientze, and

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A. FUNDED EXTERNAL GRANTS

ANDERSEN, L.

Sara Young, $18,000,000, (2004-2009).

HAMILTON, M.


HODGSON, T.


KLAPPER, I.


KWAPISZ, J.


LUEBECK, J.


PERNAROWSKI, M.


ROBISON-COX, J.


SIMONSEN, L.


STANLEY, L.


VOGEL, C.


**B. FUNDED INTERNAL GRANTS**

BOIK, R.

“Exploratory and Confirmatory Principal Components and Influence Diagnostics for Principal Components,” BEST Award, $6,600, (2004).

LUEBECK, J.


SOJDA, M.