2010-2011 Annual Report

Department: ______Mathematics______________

Learning: Undergraduate

Faculty and departmental teaching awards (incl. college, university and national awards):

Undergraduate student achievements and awards (e.g., Goldwater Scholars, Man/Woman of the Year):

In the Mathematical Contest in Modeling (MCM), sponsored by COMAP (the Consortium for Mathematics and Its Applications), the paper by the team of

Will Frey
Patrick O'Neil
Evan Menchini

was designated Outstanding. Of the 2775 entries in this international contest, only 8 received the highest ranking of Outstanding. Will, Patrick, and Evan also were the MAA Prize recipients for the VHF network problem on which about 1500 teams worked.

Undergraduate student Caleb Magruder was an author on the paper

**Charles “Casey” Baker of Great Falls, Va.,** a junior honors student triple majoring in physics, biological sciences, and mathematics in the College of Science, has been awarded a Barry M. Goldwater scholarship for the 2011-2012 year.

Baker was also recently named an ACC Undergraduate Research Scholar.

**Grants in teaching and learning (e.g., PhysTec):**
One to two notable events or programs related to undergraduate education (e.g., first year of a signature course or FYE):

The five VT teams in the Mathematical Contest in Modeling (see above entry) represented 1 in every 70 U.S. teams in the contest.

**Learning: Graduate**

Graduate student achievements and awards (incl. college, university and national awards):

Grants related to graduate education (e.g., IGERTS):

One to two notable events or programs related to graduate recruitment and/or education:

Continued “Visitors’ Day” two-day spring recruiting event.

Instituted “Research Days” two-day fall event. Primary purpose is professional development of current graduate students. Secondary purpose is recruiting.

**Discovery**

Faculty awards/honors (e.g., NSF CAREER awards, Humboldt Fellowships):

John Burns was awarded the 2010 W.T. and Idalia Reid Prize in Mathematics by the Society for Industrial and Applied Mathematics.

Ezra Brown received the Mathematical Association of America’s 2010 Carl B. Allendoerfer Award for Excellence in Expository Writing (with Keith Mellinger), for —Kirkman’s schoolgirls wearing hats and walking through number fieldsl, Mathematics Magazine, vol. 82, (February 2009), pp. 3-15.

George Hagedorn was a nominee for the Dannie Heineman Prize for Mathematical Physics (administered jointly by the American Physical Society and the American Institute of Physics).

Notable research awards (incl. PIs, Amount, Title and Funding Agency):

John Burns, co-PI, and five other members of the Math faculty, “Advanced Computer Design


Laubenbacher (PI), Burns, Zietsman (co-PIs)

Number of manuscripts, number of books and book chapters (CY 2010); high impact papers:

92 papers
5 book chapters
1 book
2 books edited

Number of presentations (CY 2010); notable invited lectures:

166


R. Laubenbacher, Expert witness at Congressional Hearing on 21 Century Biology, Subcommittee on Research and Education of the House Committee on Science and Technology, June 29, 2010.

M. Shimozono
Expository Lecture Series to graduate students and young researchers
(i) 3 lectures on Equivariant Cohomology at the Summer School on Affine Schubert Calculus at the Fields Institute, Toronto, July 7-10, 2010.
(ii) 4 lectures on Schubert Calculus at the Summer School on Representation Theory at the University of Cologne, Germany, October 4-8, 2010.
(iii) Four lectures on Affine Schubert calculus to graduate students at the Taipei Winter School in Representation Theory, Academia Sinica, Taipei, Taiwan, December 16-19, 2010.
Engagement

Faculty service (Editorships, NSF/NIH program managers or panel members, leadership positions in professional societies):

**SLIMANE ADJERID**

Associate Editor:
Journal of Mathematical Problems in Engineering

**JOSEPH BALL**

Integral Equations and Operator Theory
(handling editor for 2 papers in 2009)

Journal of Mathematical Analysis and Applications (handling editor for 29 papers in 2009)

Complex Analysis and Operator Theory (handling editor for 3 papers in 2009)

Banach Journal of Mathematical Analysis (handling editor for 3 papers in 2010)

Co-editor for IWOTA 2009 Proceedings volume: handling editor for 1 Contribution

Co-editor for IWOTA 2010 Proceedings volume: handling editor for 2 Contributions

Member of 5-person Editorial Board for the book series Operator Theory: Advances and Applications published by Birkhauser-Verlag

**JEFF BORGGAARD**

Associate editor of Optimization and Engineering, Springer.

Associate editor of ISRN Applied Mathematics, Hindawi Publishing (new journal).

**ERZA BROWN**

Associate Editor for the American Mathematical Monthly (Problems and Solutions)
Department—refereed and compiled solutions for six problems)

Editorial Board, INTEGERS: The Electronic Journal of Combinatorial Number Theory

Editorial Board, Math Horizons

JOHN BURNS

Associate Editor – Mathematical Problems in Engineering, 2008 – Present.

Associate Editor - Journal of Dynamical and Control Systems, 1994-Present

ERIC DE STURLER

Editorial Board Applied Numerical Mathematics

Editorial Board International Journal on Computational Science and Engineering

Editorial Board Open Applied Mathematics Journal

SERKAN GUGERCIN

Associate Editor for Systems and Control Letters

Member of the IEEE Conference Editorial Board

TERRY HERDMAN

Associate Editor, Journal of Integral Equations and Applications

REINHARD LAUBENBACHER

Member, Editorial Board, Journal of Algebra

Member, Editorial Board, Bulletin of Mathematical Biology

Member, Editorial Board, Journal of Symbolic Computation

Member, Editorial Board, Applied Mathematical Sciences book series, Springer Verlag
Member, Editorial Board, Mathematical Modelling: Theory and Applications book series, Springer Verlag

MICHAEL RENARDY

Editor, Zeitschrift fuer angewandte Mathematik und Physik
Co-Editor, Mathematical Methods in the Applied Sciences
Co-Editor, SIAM Problems and Solutions (electronic publication)
Co-Editor, International Journal of Pure and Applied Mathematics
Co-Editor, Zeitschrift fuer angewandte Mathematik und Mechanik
Co-Editor, Qualitative Theory of Differential Equations and Applications
Co-Editor, International Journal of Mathematics and Computation

YURIKO RENARDY

Editorial Board for the Journal of Non-Newtonian Fluid Mechanics, a journal published by Elsevier

Associate Editor of the IMA (Institute for Mathematics and Its Applications) Journal of Applied Mathematics, a journal published by Oxford University Press

ROBERT ROGERS

Editorial Board Member – ZAMP

DAVID RUSSELL

Associate Editor; Journal of Mathematical Analysis and Applications (processed about 40 papers during 2010)

Associate Editor; Discrete and Continuous Dynamical Systems, Series B (processed just a few papers during 2010)

Honorary Editor: International Journal for Information Systems and Sciences

SHU-MING SUN
I became an Associate Editor for the Journal of Applied Mathematics and Physics (ZAMP) in the fall of 2010.

LIZETTE ZIETSMAN

Associate editor for IEEE Conference on Decision and Control

Associate editor for IEEE American Control Conference

Joe Ball

Member of the Presidium of IWOTA, the 4-member governing body for IWOTA (International Workshop on Operator Theory and Applications): main duties: presiding over Steering Committee meetings where locations of future meetings and decisions on IWOTA Proceeding volumes are negotiated.

Member of MTNS (Mathematical Theory of Networks and Systems) Steering Committee: duties similar to those for IWOTA Presidium.

John Burns

Member of SIAM Committee on Science Policy, 2010 – Present

Member of SIAM Committee on Why Do Math Project 2007 – Present.

Terry Herdman

Member of SIAM Education Committee.

Member of selection committee for SIAM’s W.T. and Idalia Reid Prize.

Member of SIAM Careers and Professional Development Committee.

Council member for the Coalition for Academic Scientific Computation.

Board member, Oak Ridge Associated Universities.

Reinhard Laubenbacher

Vice President for Science Policy, Society for Industrial and Applied Mathematics (SIAM), 2009-2013

Chair, Committee on Science Policy, Society for Industrial and Applied mathematics, 2009-2013
Member, Steering Committee for SIAM Activity Group in Algebraic Geometry

Member, Systems Biology Working Group, Natl. Inst. Allergies and Infect. Diseases (NIAID)

Member, Study Section on Cancer Genetics, National Cancer Institute, October 2010

Member, Study Section on Biological Data Management and Analysis, National Institute for General Medical Sciences, 2010

Yuriko Renardy


Jeff Borggaard

On review panel for the Ralph E. Powe Junior Faculty Fellowship, sponsored by Oak Ridge Affiliated Universities (March 2010).

Eric de Sturler

NSF Panel Computational Mechanics, June 8, 2010.

Yuriko Renardy

National Science Foundation Division of Mathematical Sciences Career Panel, November, 2010.

Fellowship Selection Committee for the American Physical Society Division of Fluid Dynamics, 2011-2012.

Various

Reviewed proposals for the National Science Foundation, the National Institutes of Health, the National Academy of Sciences, the National Security Agency, and the research foundations of Hong Kong, Ireland, the Netherlands, Canada, and Australia.

Examples of economic development (e.g., industrial partnerships, patents):
Study Abroad programs:

M.S. exchange program with the Karlsruhe Institute of Technology (German) regularly brings 2-3 graduate students to VT for one year of study.

PK-12 STEM programs:


Community and Student Engagement:

The Virginia Tech Regional Mathematics Contest, in its thirty-second year, continued to grow, with participation by 575 students from 97 colleges in 26 states.

Two faculty members advised two science fair projects by four high school students, and one faculty member advised an independent study by a high school student.

Three faculty members served as secondary school and regional science fair judges.

One faculty member led a fund-raising effort that allowed the Blue Ridge Highlands Regional Science Fair to continue.

Two members of the faculty were judges for the Moody’s Mega Math Challenge.

One faculty member served as a judge for the Intel International Science and Engineering fair.

Reinhard Laubenbacher is the Director of Kids’ Tech University.

Diversity

One to two notable activities by students, faculty and/or staff activities promoting diversity:

Elizabeth Niese was the Summer Mathematics Director for the Center for the Enhancement of Engineering Diversity.

Two faculty members are mentors in professional mentoring networks organized by MentorNet and the Association for Women in Mathematics.

Reinhard Laubenbacher is a member, External Advisory Committee, Alliance for the Advancement of Biomedical Research Excellence in Puerto Rico (AABRE-PR) 2005-present.

James Turner is a Spelman College ASPIRE Advisory Board member.
Diversity awards and honors (e.g., MAOP scholarships; McNair Scholars):

2011 VT Excellence in Access and Inclusion Awards to:

Jerrí England;
Catherine Stephens;
Math Department team of Susan Anderson, Steven Boyce, Lea Cully, Kasie Farlow, Peter Haskell, Valerie Holcombe, Megan Hope, Jessica Kline, Christina Ko, Jessica Schmale, and Angela Zanchi.

2011 Sally Bohland Award for Exceptional Leadership in Access and Inclusion to Peter Haskell.