From the Chair’s Corner

Greetings Alumni and Friends,

It is time once again to provide you all with an update of our past year. The department is making great progress in its commitment to educating our students with a solid background that will provide them success in their future endeavors. One indicator of this claim’s fulfillment is embodied by our two students who recently passed the first actuary exam—an achievement of great value as they seek summer internships that could then become full-time careers. Also, two of our graduate students wrote a thesis for their master’s degrees, and some of our undergraduates have undertaken summer internships and research projects with faculty. Along with these accomplishments, our faculty offers rigorous courses that the students appreciate as reported by the latest National Survey of Student Engagement (NSSE) survey.

We were recently informed that Dr. Yuhlong Lio received the President’s Award for Research Excellence in the Established Faculty category. All of our faculty work hard and continue to publish their work in journals of their respective fields of research. We are truly blessed to have such talent in the department for mentoring our students.

One big item on the department’s horizon is next summer’s move to Patterson Hall. This past summer, the building underwent a substantive renovation which included air conditioning and an elevator for the building. In preparation for the move, I downsized a lot of things in the department that needed to be shredded, recycled or thrown away. Since this has been our home for quite some time, you can imagine all that has accumulated over the years—such as old grade books from the 1920s and 1930s. Do not worry, I did not look up any of your grades, but it was a bit nostalgic given the department’s many years of solid educational history. Once again, we thank you for your support of USD and our department. As always, please stop in if you are ever in the area.

Dan Van Peursem
Professor and Chair
Department of Mathematical Sciences

STUDENT ACTIVITIES/ACHIEVEMENTS

Joint Mathematics Meetings 2015
Mathematics graduate students Trenton Brown and Quy Xuan Cao received student travel grants to participate in the 2015 Joint Mathematics Meetings in San Antonio, Texas, from Jan. 10–13.

Cao presented a research paper, “A Dynamic System based on Weibull Distribution,” co-authored with Dr. Yuhlong Lio, Dr. Nan Jiang and Dr. T.R. Tsai.

Brown’s paper, “Maximum Likelihood Estimation for the Generalized Exponential Distribution Parameter under Progressive Type-II Censoring,” was co-authored with Dr. Yuhlong Lio and Dr. Nan Jiang.

Dr. Lio accompanied the students to the conference.

Mathematical Association of America–North Central Section Math Competition
Matthew Buhr, Corina Larson and Peter Petrasko represented USD in the annual Mathematical Association of America (MAA)-North Central Section Mathematics Competition held on Nov. 15, 2014. Ninety teams from colleges in Minnesota, North and South Dakota and Manitoba, Canada, participated. The USD team placed in the top one-third pool, a performance which is considered commendable and is acknowledged by the MAA on their website. Coached by Catalin Georgescu and Gabriel Picioroaga, the students prepared for about two months for the three-hour test.

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**Summer Research Experiences for Undergraduates (REU)**

This past summer **Allie Holland** spent six weeks in Pittsburgh, Pennsylvania, with the Summer Institute for Training in Biostatistics (SIBS) program. As a final project, Allie worked with data from the Center for Oral Health Research in Appalachia (COHRA) study. Specifically, they worked on psychosocial variables and dental caries attempting to find a relationship between how a mother rates herself and family under the specified categories and the number of dental caries she has.

From June 15–July 24, 2015, **Corina Larson** attended a training program for biostatistics, epidemiology and statistical computing on the University of Minnesota campus. The Summer Institute in Biostatistics (SIBS) research opportunity was provided by the National Institutes of Health: The National Center for Advancing Translational Sciences and the National Heart, Lung, and Blood Institute. This six-week immersion program introduced undergraduate students to the study of biostatistics as they listened to lectures given by prominent individuals in the field, learned statistical programming skills, and visited companies and hospitals that employ biostatisticians.

This past summer **Carrie Wintle** was awarded a UDiscover grant to work on research that she will use to write her Honors thesis next year. Carrie is combining her love of mathematics and cheerleading to develop a mathematical model of basket tosses. She intends to model several different position combinations of the basket tosses in effort to potentially help people in the area of sports injuries as they can use this model to calculate forces on the joints. Supervising the research is her advisor, Dan Van Peursem.

**IdeaFest 2015**

IdeaFest, an annual campus event showcasing student research and creative accomplishments, was held on April 15–16. Three of our mathematics majors presented talks this year.

**Matthew J. Buhr** presented “Dynamics of Glial Cell Defense Mechanisms in Response to Ischemic Hypoxia in the Brain.” Faculty Advisor: José Flores

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**Nebraska Conference for Undergraduate Women in Mathematics**

Students **Geralyn Palmer**, **Corina Larson** and **Carrie Wintle** attended the 17th Annual Nebraska Conference for Undergraduate Women in Mathematics, held at the University of Nebraska–Lincoln, on Jan. 23–25.

**South Dakota Council of Teachers of Mathematics**

Mathematics education students **Brad Wood**, **Joey Olson**, **Jarod DeBey** and **Jake Roskam** attended the 23rd Annual SDCTM Conference, on Feb. 6–7, in Huron, South Dakota. Dan Van Peursem accompanied the group.

At the conference, Van Peursem also served as the facilitator for a panel discussion on “Discussions with Higher Education,” where policies affecting high school students as they transition to our BOR universities were discussed.

**Buhr Places at National Conference**

**Matthew Buhr** received first place at the 2015 Emerging Researchers National (ERN) Conference in STEM for his oral presentation on mathematics and statistics. The conference was held in Washington, D.C., on Feb. 19-21.

**2015 Math on the Northern Plains Conference**

Dordt College in Sioux Center, Iowa, was the host of the 2015 Math on the Northern Plains Undergraduate Research Conference on April 11. José Flores accompanied students **Matthew Buhr** and **Joseph Mammo** to the conference. Student presentations included “Dynamics of Ateles Hybridus Populations in Fragmented and Non-Fragmented Landscapes, a Discrete Mathematical Model,” by Matthew Buhr. José Flores was his advisor.

**Pi Mu Epsilon**

New members of the South Dakota Alpha Chapter of the Pi Mu Epsilon national mathematics honor society were inducted on April 22. Inductees were **William Belch**, **Michael Bosch**, **Carrie Brown**, **Andrew Bruns**, **Corina Larson**, **Katelyn Paulson**, **Colleen Reeves**, **Carrie Wintle**, and **Bradley Wood**. Teresa Chasing Hawk is the advisor for the USD chapter.
Merten Hasse Math Contest

On Sat., April 11, the 60th Merten Hasse Mathematics competition for junior and senior high school students was held here on campus. Ten schools attended this year, with 220 students participating. Winning the large school division was Central Academy (Des Moines, Iowa). Bon Homme (South Dakota) High School won the small school division. Austin Haack, from Lincoln High School (Sioux Falls, South Dakota), was awarded a $600 tuition scholarship to USD. Sandi Shumaker is the contest director.

2014–2015 Graduates

Morgan M. Barnes (B.S.)
Advisor: Yuhlong Lio

Matthew Buhr (B.S.)
Advisor: José Flores

Brittany E. Blaseg (B.S.Ed.)

Alex De Vries (B.S.Ed.)

Rebecca Rathbun (B.S.)

Bradley Wood (B.S.)

Graduate Students

Luke W. Benjamin (M.A.)
Trenton N. Brown (M.S.)
Thesis: “Control Charts for the Generalized Exponential Percentile Function”
Advisors: Yuhlong Lio and Nan Jiang

Quy Xuan Cao (M.S.)
Thesis: “A Dynamic System using Baseline Weibull Distribution Based on Sequential Order Statistics”
Advisor: Yuhlong Lio

Josh A. Carini (M.A.)
Adam McDermaid (M.A.)
Naomi E. Sazama (M.A.)

IdeaFest 2015 (cont.)

Ricardo Cervantes presented “An introduction to the Two Sex Model.”
Faculty Advisor: José Flores

Steven Nathan Harding presented “Generalized Walsh Transforms, Cuntz Algebras Representations and Applications in Signal Processing.”
Faculty Advisor: Gabriel Picioroaga

Math Club

The USD Math Club was active again this past year. Activities included game night, bowling, serving Yote floats and serving pie for Pi Day. USD mathematics faculty enlightened the group with interesting math talks. Members of the club also assisted with the South Dakota Science Olympiad competition and proctored exams for the Merten Hasse Math Contest. Lynnette Crawford is the faculty advisor for the club.

Representing the Math Club: Marvin Gamble, Colleen Reeves and Dan Van Peursem enjoyed making Yote floats for passersby in the MUC.

Last fall, the corn maze was rained out, but the Math Club did venture there earlier this fall.
President’s Research Award

**Yuhlong Lio** was presented the President’s Award for Research Excellence: Established Faculty. Lio, a tenured mathematical sciences professor, has demonstrated a consistent record of publication, particularly in international peer-reviewed journals. External agencies such as the National Science Foundation have sought his scholarly expertise on proposals and international conferences, and he has served as editor for various prestigious journals. His work includes theoretical, pure, applied, industrial and medical mathematics, as well as computational skills for the field.

**Yuhlong Lio** was invited to Taiwan to visit the Department of Applied Mathematics at Chung-Yuan Christian University and the Department of Statistics at Tamkang University in May 2015. While there, he gave a talk at each university, along with a talk at the Department of Mathematics at National Tsing Hua University, and collaborated on research. He also presented his research at the Joint Statistical Meetings 2015, held in Seattle, Washington, on Aug. 9-13.

**José Flores** was on sabbatical during the fall 2014 semester and worked with the Biodiversity Lab at the National Center for the Environment at the University of Chile in Santiago, Chile. At this site, researchers started working on the initial stages of the project “Mathematical models for the complexity-stability of food webs in polluted environments.” This project addresses the problems of pollution, which currently represents one of the major threats to biodiversity and affects several interacting species simultaneously. The lack of a robust theoretical framework about the effects of pollutants on the dynamics and stability of food webs represents a crucial limitation of ecological theory. In this study, Flores and fellow researchers evaluate the effects of accumulated pollutants on the relationship between the complexity and stability of food webs. Flores continues on this research at USD, building food web models with different levels of richness and connectedness and using a bioenergetics model to project the dynamics of species biomass.

**Gabriel Picioroaga** and graduate student **Steven Nathan Harding** attended the Iowa-Nebraska Functional Analysis Seminar in Des Moines, Iowa, on Oct. 18, 2014.


On Feb. 2 at noon, **Dan Van Peursem** participated in the campus Flash Lecture Series sponsored by the USD Honors Program. He discussed “Alexander Pell: The Connection between USD’s Math Department and a Russian Rebel Wanted for Murder” with students in the MUC Pit Lounge.

Department Seminar Series 2014–15

Gabriel Picioroaga, coordinator of the department seminar series, scheduled many interesting talks this past year.

**October 16**
Harry Freeman (University of South Dakota)
Title: “How strong is our love for one person?”

**November 5**
Steven Nathan Harding (University of South Dakota)
Title: “Generalized Walsh transforms, Cuntz algebras representations and applications in signal processing”

**November 20**
Benton Duncan (North Dakota State University)
Title: “Algebras associated to continuous dynamics”

**February 3**
Eric Weber (Iowa State University)
Title: “Spectral Theory of Small Hadamard Matrices”

**March 5**
Mike Janssen (Dordt College)
Title: “Symbolic Powers of Ideals: Problems and Progress”

**April 23**
Edoardo Persichetti (Dakota State University)
Title: “Post-Quantum Cryptography”
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Thanks for supporting our mathematics majors at USD.
Your generosity is greatly appreciated!

We would enjoy any news you would like to share about yourself or any comments you have about our department.

2015–2016 Scholarship and Award Offers

Dr. Marjorie H. Beatty
   Ryan Nichols – Dell Rapids, S.D.
Howard Connors
   Carrie Wintle – Iroquois, S.D.
Cleland Cook
   Corina Larson – Aberdeen, S.D.
William E. Ekman
   Katey Krager – Ida Grove, Iowa
   Brenna Lervick – Chanhassen, Minn.
Ekman Gutzman Leadership
   William Belich – Rochester, Minn.
   Miles Death – Plymouth, Minn.
   Zachary Dockter – Mobridge, S.D.
Gutzman Family
   Miles Death – Plymouth, Minn.
   Lauren Gilliland – Wayne, Neb.
   Carter Kerber – Sioux Falls, S.D.
   Harrington Book Award
      Ricardo Cervantes – San German, Puerto Rico
   Merten M. Hasse
      Lane Suing – Fordyce, Neb.
   Dr. Andy E. Karantinos
      Miles Death – Plymouth, Minn.
      Mark Haar – Sioux Falls, S.D.
   Rick and Kathi Kessler Math Achievement
      Zachary Dockter – Mobridge, S.D.
   Nelontine Maxwell Larsen
      Quy Xuan Cao – Hanoi, Vietnam
   Even and Anne Larson
      Crystal Wharton – Huron, S.D.
   Thomas Emery McKinney
      Colleen Reeves – Rogers, Minn.
   Reise W. Officer
      Ashley Slama – Pierre, S.D.
   Curtis and Lynda Olson
      Michael Bosch – Sioux Falls, S.D.
   Dr. Alexander Pell
      Shannon Graham – Columbus, Neb.
   Pi Mu Epsilon
      Shannon Graham – Columbus, Neb.
   Ralph Richardson
      Shannon Graham – Columbus, Neb.
   Nicholas Niehus – Lawton, Iowa
   Royal and Cora Scott Family
      Zachary Dockter – Mobridge, S.D.
   Bessie Kimball Thurber
      Allie Holland – Rapid City, S.D.
      Ashley Slama – Pierre, S.D.
   David Walish in honor of Howard Connors
      Zachary Dockter – Mobridge, S.D.
   Robert L. Walter
      Nathan Wynia – Canton, S.D.
Mathematics Scholarships at the USD Foundation

Dr. Marjorie H. Beaty – awarded to South Dakota residents with high academic qualities
Howard Connors – awarded to undergraduate students
Dr. Cleland Cook – awarded to math or math education majors
William E. Ekman – awarded to deserving students with financial need
Ekman Gutzman Leadership – awarded to undergraduate math majors who meet requirements
Gutzman Family – awarded to deserving undergraduate students
Merten M. Hasse – awarded to undergraduate students with preference given to minorities
Dr. Andy E. Karantinos – awarded to undergraduate students
Rick and Kathi Kessler – awarded to math major
Nelontine Maxwell Larsen – awarded to the outstanding graduate student
Even and Ann Larson – awarded to undergraduate students
Thomas Emery McKinney – awarded to the outstanding senior who has shown power and originality in mathematics
Reise W. Officer – awarded to undergraduate student
Curtis and Lynda Olson – to be awarded to deserving undergraduate students
Dr. Alexander Pell – awarded to prominent students
Pi Mu Epsilon – awarded to a senior member of Pi Mu Epsilon
Wallace Raab – provides student MAA memberships and a scholarship to a graduate student
Ralph Richardson – awarded to undergraduate students
Royal and Cora Scott Family – awarded to undergraduate students
Bessie Kimball Thurber – awarded to deserving undergraduate students
David Walsh in Honor of Howard Connors – awarded to undergraduate students
David Walsh in Honor of Bill Ekman – awarded to incoming freshmen
Robert L. Walter – awarded to worthy undergraduate mathematics education students