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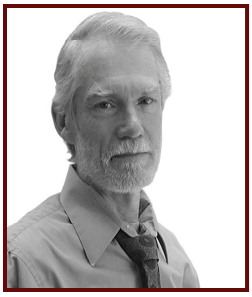
DEPARTMENT OF MATHEMATICS NEWSLETTER

THIS ISSUE IS DEDICATED TO EMERITUS PROFESSOR DANIEL J. RUDOLPH

INSIDE THIS ISSUE:



The Department of Mathematics is deeply saddened by the sudden loss of our colleague Professor Daniel Rudolph. Professor Rudolph was a dedicated professional and contributed greatly to all aspects of our department's life. His research, mentoring of graduate students, teaching and service were exceptional. During the last few months of his illness, his mind was sharp and his dedication and commitment to Mathematics and to our department never wavered. He is sorely missed. A brief summary of Professor Rudolph's professional career follows.

Professor Rudolph received his B.S. from Caltech in 1972 and his Ph.D. from Stanford University in 1975. His thesis advisor was D. S. Ornstein. Following appointments as a postdoctoral fellow at the Hebrew University of Jerusalem and the Miller Institute at UC Berkeley, he spent three years as an Assistant Professor at Stanford University. He then joined the University of Maryland as an Associate Professor, becoming Full Professor in 1985. Professor Rudolph moved to Colorado State in 2004 as the first Albert C. Yates Endowment Chair of Mathematics.

Professor Rudolph worked in the area of ergodic theory, a central branch of dynamical systems. His research was in the forefront of developments in ergodic theory throughout his career and his work had a sustained impact in the field. Professor Rudolph published over 70 research articles and two research level books. He consistently published his work in leading journals and many of his papers have appeared in the best journals. Recently, Professor Rudolph and colleagues submitted a 70 page manuscript to the Annals of Mathematics culminating eight years of work. His books and articles have been cited more than 600 times (unfiltered Google Scholar citations). Professor Rudolph was also a sought-after speaker and gave 70 invited lectures. As one measure of his standing in the mathematical community, Professor Rudolph's research has been continuously supported by the NSF since 1976. His latest support from the NSF was an individual five-year research grant, an award only given to elite mathematicians.

Professor Rudolph earned a number of awards and distinctions during his career. These include: Pacific Institute of Mathematical Sciences (PIMS) Distinguished Chair, 2004; Invited symposium lecture at the International Congress of Mathematics in Beijing in 2002; appointment as a Wilson Fellow at the Institute for Advanced Studies at the Hebrew University of Jerusalem, 1996-7; CNRS Grant, University of Paris VI, 1989; Sloan Foundation Fellow, 1981-82. He was appointed as the Albert C. Yates Chair in Mathematics, Colorado State University in 2004 and again in 2010.

Professor Rudolph's career was also distinguished by his contributions to education at the undergraduate, graduate, and post-graduate levels. He was Co-Principal Investigator for a NSF VIGRE award, Department of Mathematics, University of Maryland, 2003-8 and received the Distinguished Scholar-Teacher Award from the University of Maryland in 1987. He advised a total of nine doctoral students during his career. At CSU, he was very involved with developing the first year graduate analysis courses that play a central role in the recent reforms in the Ph.D. program in mathematics. Professor Rudolph organized and participated in a number of local summer programs related to mathematics in grades K-12.

SPECIAL RECOGNITION

Congratulations to Beth Malmskog who received a summer internship at Microsoft Research in the cryptography division. Beth's Ph.D. advisor is Dr. Rachel Pries.

FACULTY AWARDED PROMOTIONS AND TENURE

Dr. Chris Peterson was promoted to Full Professor in May 2010. Dr. Peterson received his Ph.D. in Mathematics from Duke University in 1994. He joined the Mathematics Department at Colorado State in 1999 as an Assistant Professor. He was granted promotion and tenure in 2004. Dr. Peterson's broad area of research in the field of algebraic geometry and closely related areas include commutative algebra, algebraic geometry, and numerical algebraic geometry/geometric data analysis.

Dr. Vakhtang Putkaradze was promoted to Full Professor in May 2010. Dr. Putkaradze received his Ph.D. in 1997 in Physics from the University of Copenhagen. He joined the Mathematics Department at the University of New Mexico in 1999, receiving tenure in 2004. Joining Colorado State in 2005, Dr. Putkaradze continues his work in several core areas of applied mathematics and geometric mechanics, including the mathematical analysis of the Navier-Stokes equations, the analysis of the dynamic and geometric behavior of systems.

Dr. Jiangguo (James) Liu was granted tenure and promotion in May 2010. Dr. Liu received his Ph.D. from the University of South Carolina, Columbia, in 2001. From 2002-2005 he was a Visiting Assistant Professor in Mathematics at Texas A&M University. He joined Colorado State in the fall of 2005. Dr. Liu is considered a leading authority on ELLAM methods for advection/reaction systems and has made many important contributions to numerical analysis and scientific computing.

2010 NEW DEPARTMENT GRANT AWARDS

Primary PI	Co-PI	Sponsor	Title	Amount
Jennifer Mueller		HHA-NIH Biomedical Imaging and Bioengineering	Exploratory Innovations in Electrical Impedance	$192,405
Renzo Cavalieri		NSF National Science Foundation	Western Algebraic Geometry Seminar Five Year Plan	$52,940
Donald Estep		University of California Lawrence Livermore	Adjoint Based Methods for Uncertainty Quantification	$387,567
Mario C Maconi	Vakhtang Putkaradze	DOD-DTRA Defense Threat Reduction Agency	Single Molecule Detection for Counter-ing WMD using Nano-Mechanical Resonator Arrays	$502,583

COLORADO STATE HOSTS THE 2010 MAA ROCKY MOUNTAIN SPRING SECTION MEETING

Good weather and a central location led to a record attendance at the 2010 Annual Spring Section Meeting held on April 16th & 17th at Colorado State University. Amongst the 204 registered participants were 47 graduate and 44 undergraduate students, as well as several members of the business, government, and industry sector and several K-12 teachers.

The meeting officially opened on Friday afternoon with a welcome message from card-carrying MAA member and Provost and Executive Vice President of Colorado State University, **Rick Miranda**. The program then started with a presentation by the 2009 Burton W. Jones Distinguished Teacher Award recipient **Richard Grassl** (University of Northern Colorado) about working with and motivating students. The president of the MAA, **David Bressoud** (Macalaster College), gave two presentations: His talk on Friday, *Issues of the Transition to College Mathematics*, addressed the issue of college curricula in view of an increasing rate of nominally college level courses in high school. His Saturday keynote, *Proofs and Confirmations*, described the nature of research in mathematics in the example of the alternating sign matrix conjecture.

Friday afternoon also saw an invited talk by **Wade Ellis** (West Valley Community College) on *Effective Learning with Software Tools.*

Friday evening's banquet address was by the 2010/11 Pólya Lecturer, **Judy Walker** (Uni of Nebraska, Lincoln). Her presentation was entitled *Codes on graphs: Shannon's challenge and beyond* and gave an overview of coding theory from its beginnings to current research.

The contributed paper program on Friday afternoon and Saturday morning included an array of 77 speakers, including 43 undergraduate and graduate students. The program included sessions on *Combinatorics, Mathematics Education Research, History of Mathematics,* and *Pure and Applied Mathematics* as well as a general *Contributed Papers* session. In addition, the program included a number of *Undergraduate Research* and *Graduate Research* sessions. Other meeting activities included a workshop on Friday morning, conducted by **Stephanie Fitchett** (NSF and University of Northern Colorado) on *Grant applications with the NSF DUE*, a lunch for MAA liaisons and chairs and a MAA Book sales display.

A special thanks to Alexander Hulpke for planning and organizing this conference. A job well done!!

2010 ARNE MAGNUS LECTURE SERIES

Professor Gunther Uhlmann

Walker Family Endowed Professor of Mathematics

University of Washington
Department of Mathematics

The Department of Mathematics held their Annual Arne Magnus Lecture Series from April 14-15, 2010. Professor Uhlmann's public lecture was entitled *Cloaking, Invisibility and Inverse Problems*. The main goal of this lecture was to describe recent theoretical and experimental progress on making objects invisible to detection by electromagnetic waves, acoustic waves and quantum waves. For the case of electromagnetic waves, Maxwell's equations have transformation laws that allow for design of electromagnetic materials that steer light around a hidden region, returning it to its original path on the far side. Not only would observers be unaware of the contents of the hidden region, they would not even be aware that something was being hidden. The object, which would have no shadow, is said to be cloaked. He recounted the recent history of the subject and discussed some of the mathematical issues involved.

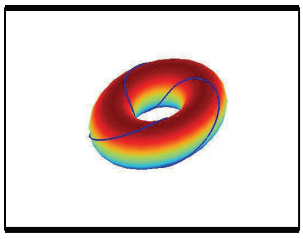
An additional colloquium entitled *30 years of Calderón's inverse problem* which focused on Calderón's problem consists in finding the electrical conductivity of a medium by making voltages and current measurements at the boundary. Professor Uhlmann also described the progress that has been made on this problem since Calderón's seminal paper in 1980.

Another lecture entitled *Travel Time Tomography and Boundary Rigidity* was also given for faculty and graduate students. In this lecture, Professor Uhlmann described a surprising connection between Calderón's inverse problem and travel time tomography.

The Arne Magnus Lectures are given annually in the Department of Mathematics at Colorado State University in honor of Dr. Arne Magnus, our friend and colleague for 25 years. The 2009 lectures were supported by the Arne Magnus Lecture Fund and the Albert C. Yates Endowment in Mathematics. Contributions to the Magnus Fund are greatly appreciated and may be made through the Department of Mathematics.

Please contact Sheri Hofeling (hofeling@math.colostate.edu) at (970)-491-7047 for specific information.

DEPARTMENT HOSTS MATH CIRCLES SUMMER PROGRAM



Math Circles 2010 is a week-long math camp to be held July 5-9 for Poudre School District students entering 8th and 9th grades. The first Math Circles summer program for girls was held last summer under the direction of the late Dan Rudolph, with assistance from Martha Cranor, a math instructor in the Poudre School District. The success of this event in 2009 and Dan's interest in expanding the camp has led to a combined Math Circles for boys and girls this summer, with organizers Michael Kirby and Chris Peterson. Given the target audience, the emphasis will be on active and experiential learning including a Mathematical Treasure Hunt, a barbecue and ultimate frisbee on the oval. Participants will be welcomed to CSU campus by Dean Nerger. If you are interested in being a part of Math Circles 2010 we are looking for faculty and graduate students to volunteer in assisting with breakout sessions with student-teacher ratios to be 5:1.This event is being offered in collaboration with the Poudre School District and advertised through the Gifted and Talented Program. We are limiting registration to the first 25 boys and 25 girls who apply, so if you know someone who may be interested, encourage them to submit an application without delay. For more information go to: http://www.math.colostate.edu/Math%20Circles%202010v3.pdf To become a volunteer, contact graduate student Elly Smith at: smith@math.colostate.edu

Cassandra Williams Winner of 2009 CNS Graduate Student Excellence in Teaching Award

Congratulations to Cassandra Williams, graduate student in the Department of Mathematics, for being a recipient of this year's College of Natural Sciences Graduate Student Excellence in Teaching Award. Amanda Elise from Psychology was also recognized. In addition, the CNS gave award recognition for Faculty Excellence in Undergraduate Teaching Award to Lisa Dyslesk (Chemistry) and Faculty Excellence in Undergraduate Research Mentoring to Patricia Bedinger (Biology) and Ross McConnell (Computer Science).

Each year, these awards recognize truly outstanding teaching and mentoring in the College of Natural Sciences, with a number of outstanding nominees, making the selection difficult. Clearly, this year's winners were considered the best of the best.

Recipients were also presented with a $500 monetary award publically presented at the College of Natural Sciences Professor Laureates Lecture and Reception held on April 29, 2010.

Cassie's Ph.D. advisor in the Department of Mathematics is Dr. Jeff Achter.

THE CAMPAIGN FOR Colorado State University

Colorado State University students and faculty embody a spirit of service and a passion for innovation. Our alumni and friends exemplify the value of relationships and tradition. As the state's land-grant University, we honor our history and responsibility to provide access to excellent public higher education. The Campaign for Colorado State University represents a vote of confidence in everything we do, everything our University stands for. This $500 million campaign increases financial support for students and faculty. It strengthens learning and research experiences. It improves and expands facilities for our growing campus community. The campaign challenges all those who believe in CSU and its mission to help secure its future. *Your gifts allow us to open doors, change lives, and transform our world.*

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http://www.campaign.colostate.edu/