

Mathematics & Statistics

Old Dominion University



Message from the Chair:

Dr. Hideaki Kaneko

It has been a privilege to lead this active and vibrant department. The AY 14-15 was quite an eventful year. The department was visited by many speakers of national and international prominence. The Richard F. Barry Colloquium Series, as you see on the department webpage, lists a long line of such scholars. We have successfully filled five positions by a group of highly qualified candidates. It is my pleasure to announce that the following faculty members have joined the department.



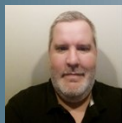
Dr. Michelle Danaher – Lecturer: Dr. Danaher received her Ph.D. in Statistics from University of Maryland Baltimore County in 2012. Michelle is interested in effective teaching methodology, Bayesian order restricted modeling, testing for interaction methods for analyzing biospecimen measured in pools, measurement error, biomarker assessment, and women's health. Since 2012, she served as Adjunct Faculty at UMBC, Bryan University and Montgomery College.



Dr. Ka Young Park – Assistant Professor of Statistics: Dr. Park received her Ph.D. in Statistics from the University of Minnesota in 2013. She wrote a Ph.D. thesis entitled “Comparing Crossing Hazard Rate Functions by Joint Modeling Survival and Longitudinal Data” under the supervision of Prof. Peihua Qiu. During the AY 2014, she was a Postdoc in the Department of Biostatistics at University of Florida.



Dr. Ke Shi – Assistant Professor of Mathematics: Dr. Shi received his Ph.D. in Applied Mathematics from the University of Minnesota in 2012. He wrote a Ph.D. thesis entitled “HDG methods for Partial Differential Equations” under the supervision of Prof. Bernard Cockburn. During the last two years, he was a Visiting Assistant Professor in the Department of Mathematics at Texas A&M University.



Mr. Randall Stowe – Instructor: Mr. Stowe completed his M.S. degree in Applied Mathematics from Old Dominion University in May 2015. Previously he held a position at Thomas Nelson Community College. He brings to us excellent pedagogical skill which will be an asset to the department.

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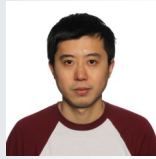
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Special points of interest

- Undergraduate & Graduate program
- Student COS Awards
- Promotions
- Research
- Teaching
- New Graduate Students



Message from the Chair Continued:



Dr. Xiang Xu – Visiting Assistant Professor of Mathematics: Dr. Xu received his Ph.D. in Mathematics from the Pennsylvania State University in 2011.

He wrote a Ph.D. thesis entitled “Topics on Stability of Complex Fluid Models” under the supervision of Prof. Chun Liu. From 2011 to 2014, he was a postdoc at Carnegie Mellon University. During the AY 2014, he served as Visiting Assistant professor at Purdue University.

NASA Langley Research Center before retiring in 2015. He also served as Consulting and Visiting Scientist at the Center for Computer Applications in Aerospace Science and Engineering (CASE) as well as at Deutsches Zentrum für Luft-und Raumfahrt (DLR). He will be teaching a graduate course, Math 825 – CFD and Solid Mechanics.

Dr. Charles Swanson – Adjunct Professor of Mathematics: Dr. Swanson received his Ph.D. from Virginia Tech in 1974. He served as Distinguish Research Associate (DRA) at

From rainbows, river meanders, and shadows to spider webs, honeycombs, and the markings on animal coats, the visible world is full of patterns that can be described mathematically.John Adam



Mathematics and Statistics Department Awards:

Awards: The following members of the department received COS teaching awards or recognition for dedicated service to the university. Congratulations to all!

- Dr. Przemek Bogacki** -received COS Outstanding Teaching Award/ tenured faculty.
- Dr. Ray Cheng** -received COS Outstanding Teaching Award/Associate Professor of Practice
- Ms. Katie Smith** -received COS Outstanding Teaching Award/Lecturer
- Dr. Moosavizadeh**- received COS Outstanding Teaching Award/Adjunct Faculty
- Ms. Miriam Venable** -was selected as the COS Staff of the Year

Promotions:

- Dr. Ruhai Zhou was promoted to Professor.
- Dr. Raymond Cheng was promoted to Associate Professor of Practice.
- Dr. Terri Grant and Ms. Catherine Chamberlayne were promoted to Senior Lecturers

Michelle Pizzo attended the 12th International Planetary Probe Workshop which was held in Cologne (Köln), Germany during July 15-19, 2015. She received the Outstanding Student Poster Presentation (first place of all participating students) by the 12th IPPW Student Organizing Committee. Congratulations to Michelle for this great achievement! We asked Michelle to share her experience of the trip:

During the week of June 15 – 19, 2015, I attended the 12th International Planetary Probe Workshop in Cologne (Köln), Germany. This workshop was hosted by the German Aerospace Center (DLR), European Space Agency (ESA), National Aeronautics and Space Administration (NASA), Jet Propulsion Laboratory (JPL) managed for NASA by the California Institute of Technology, Thales Alenia Space, and Airbus Defense and Space, to name a few. This workshop, and the others prior to this year, brought together the leading experts, scientists, researchers, academics, and students from around the globe to collaborate in the field of entry, descent, and landing (EDL) probes in different planetary systems. Attendees for this workshop hailed from many different countries. I met and spoke with individuals from the United States, Germany, England, France, Belgium, Netherlands, Scotland, Italy, India, Hungary, Japan, and China, although I am sure there were representations from other countries.

Continued on page 5.



Department:

Research:

Overall, research productivity has been very strong. Faculty members published or have articles accepted for publication totaling 40 papers. They gave 44 presentations at professional meetings. The department continues to maintain a ranking in the top 100 of all mathematics departments in the US in terms of federal R&D expenditures. During the six month period ending June 30, 2014, the Department generated research funds whose total expenditure was \$395,342 and during the six month period ending December 31, 2014, the total expenditure was \$382,482. Thus, for the AY 2014-2015, the total expenditure was \$777,824. The data demonstrates that the department has maintained a high profile in the area of acquiring external funds. Our faculty members submitted a total of 30 grant proposals in the AY 14-15. We hope that the total support can be increased further as we move forward.

Teaching:

The Department generated the largest FTE among all of the departments on campus. A number of faculty members are exploring several innovative pedagogical methods in their classrooms to help students succeed in their math classes. Here are some examples: Bob Strozak is developing MML based online modules which are designed to rectify students' common mistakes in his Math 162. Michelle Danaher is teaching Math 162 classes using the Flipped Classroom technique. Robin Flanagan and Eunice Pepper, the course coordinators of Math 103 and 102 respectively, are testing a software developed by the AT/LT Co. in their classes. We believe that several instructors of Math 102/103 are testing it as well. The software is designed to help students review the basic algebra skills which are necessary to succeed in Math 102/103. If you are engaged in other innovative methods of instruction, we'd love to hear from you. While the university experiences a significant decline in the graduate school enrollment, the Department has been successful in maintaining its graduate enrollment. Dr. Cheng, GPD, has done a wonderful job in this regard. We graduated 31 BS students, 4 MS students and 8 PhD students in the AY 13-14 and 14 BS students, 4 MS students and 4 PhD students (2 in August) during AY 14-15.

Student COS Awards

Asim Timalsina – received the 2015 Philip R. Wohl Scholarship.

Charles Armstrong – Top Applied Mathematics Student in the class of 2015.

Enrique Portillo – Top Statistics/Biostatistics Student in the class of 2015.

Danae Bennett – Top Mathematics for Secondary School Teachers Student in the class of 2015.

Michelle Pizzo won the first prize for her poster presentation at the 12th International Planetary Probe Workshop, which was held in Cologne (Köln), Germany during June 15-19, 2015.

Congratulations to Michelle!

New Graduate Students:

Charles Armstrong
Jonathon Upperman
Kristine S. Gierz
Dennis Brown
Abdullah Farhat
Anissa Belalia
James Dragas

Thank you!

The following faculty members are volunteering to serve as course coordinators:

Ms. Shari Davis – Math 101M

Ms. Eunice Pepper – Math 102M

Ms. Robin Flanagan – Math 103M

Mr. Bob Strozak – Math 162M

Ms. Natalie Hutchinson – Math 163

Dr. Terri Grant – Math 200

Dr. Przemek Bogacki – Math 211, 212, 312

Dr. Gordon Melrose – Math 211, 212, 312

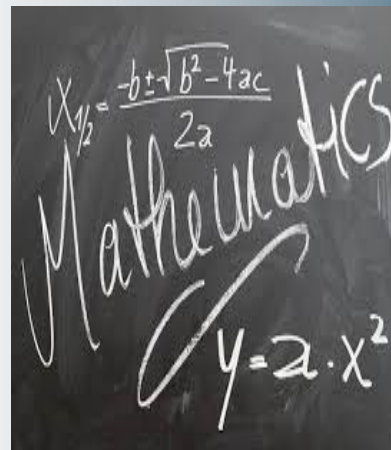
Featured Faculty:



Ms. Hutchinson: Ms. Hutchinson studied Mathematics at the Catholic University of America in Washington DC obtaining her BS degree.

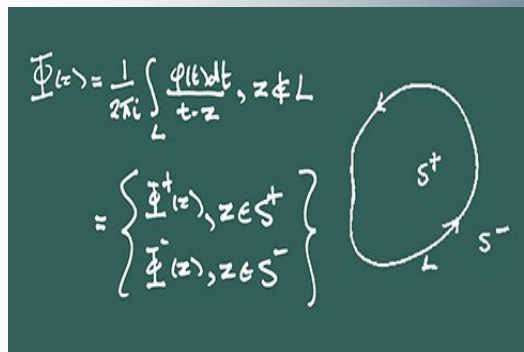
She completed her MS degree in Mathematics at California State University, Fresno in 1988. She joined the department in 1995.

In addition to her teaching, she has been very active in extra curricular activities. She served on numerous committees in the department as well as at the university level. She was Faculty Senate from 2009 to 2011. She served as a mentor to 4 graduate students to develop their pedagogical skills. Finally, she served as



President of Peninsula Council of Teachers of Mathematics from 2002 to 2003. Congratulations to you, Natalie, for all your accomplishments!

Featured Faculty:



Dr. John Tweed: Dr. Tweed joined department in 1974 as Associate Professor and became Professor in 1977. He was appointed as Eminent Professor of Mathematics in 1978. Dr. Tweed obtained his PhD from University of Glasgow (Scotland) in 1968 and was awarded D.Sc. from the same university in 1981.

John's research interests include Integral transforms, Integral Equations, Elasticity, Acoustics and Radiation Transport. He is a Fellow of the Royal Society of Edinburgh as well as Fellow of the Institute of Mathematics & its Applications.

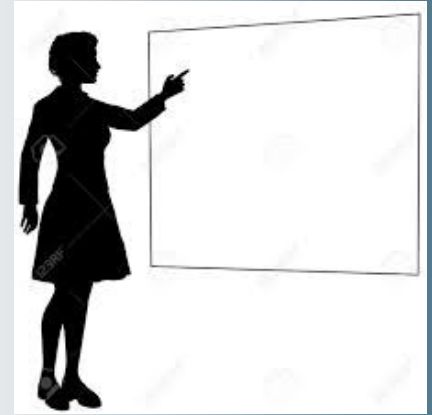
John served as Department Chair from 1984 to 1999 overseeing the growth of our academic program. He is one of the original architects of the department's PhD program. He published more than 60 research articles and graduated 12 PhD students. John has secured grants support from NASA Langley, the total amount of which exceeds \$3.9 million.

Way to go, John!

Michelle's Recap:

Session topics for the 12th IPPW included missions, EDL technologies, inflatable and deployable systems, science investigations and instrumentation, airless bodies, Europa and Titan, and cross cutting technologies. I presented research that I have been working on for the past 16 months at NASA Langley Research Center during an oral presentation entitled "Estimation of Surface Temperature and Heat Flux by Inverse Heat Conduction Methods Using Internal Temperatures Measured while Radiantly Heating a Carbon/Carbon Specimen to 1322 K" and a poster presentation entitled "Development of a One-Dimensional, Centered, Finite Volume Computational Code to Solve Direct and Inverse Heat Conduction Problems with Time-Varying Temperatures and Temperature-Dependent Thermal Properties." Both my oral and poster presentation were a part of the science investigations and instrumentation session.

Some of the highlights from my trip included getting to tour the DLR and ESA European Astronaut Centre Facilities in Cologne. The facilities I visited included the Institute of Aerodynamics and Flow Technologies Department of Supersonic and Hypersonic Technologies, Space Operations and Astronaut Training, Microgravity User Support Center, Rosetta Philae Lander Control Center, and the Institute of Aerospace Medicine. Another highlight from my trip was being awarded Outstanding Student Poster Presentation (first place of all participating students) by the 12th IPPW Student Organizing Committee. The award was decided upon by voting ballots placed by all workshop participants and each poster was judged on the presentation format and technical content.



"Dear Math, Please grow up and solve your own problems, I'm tired of solving them for you"

Michelle's Recap:

I learned a lot during my workshop attendance including work being conducted by ESA on their Intermediate Experimental Vehicle and steps being taken towards re-entry technologies, the history of entry probes and research conducted at NASA Ames, and the future exploration of Europa, Callisto, and Ganymede (moons in the Jovian system) by a single space craft. The 11 year mission to explore Ganymede and Europa is entitled JUICE (Jupiter Icy Moons Explorer). The plan for JUICE is to launch in 2022, spend ~7.6 years traveling from Earth to Jupiter (interplanetary transfer), begin orbiting Jupiter in 2030, and for the remaining time explore Jupiter's icy moons Europa, Callisto, and Ganymede

One of my favorite presentations was given by a student from the University of Glasgow. He spoke about using ultrasonic technology to penetrate the Martian surface to get underground. He stated that due to the high surface radiation on Mars, it is desired to get underground where the radiation at ~3 m is roughly the same as on the surface of Earth. However, due to the lower gravity on Mars, it is difficult to drill. He is proposing that rather than drill through the surface, to use ultrasonic vibrations on the surface to lower the surface penetration forces

Another favorite from the workshop was a presentation on the Rosetta spacecraft journey. Launched on March 2, 2004 by ESA, Rosetta traveled from over 11 years and traveled 6.5 billion km. During its journey, Rosetta had a fly-by of Mars, a fly-by of small and large bodies in the asteroid belt, and eventually traveled to and landed on a comet in the outer solar system on August 6, 2014. Whilst orbiting and flying alongside the comet (prior to landing), Rosetta observed the comet as it headed towards the inner solar system and begin to form its tail as it was warmed by the sun. The lander which Rosetta carried was named Philae. The presenter spoke about Rosetta's challenges including its restricted mass (70% of energy was required to be from gravitational assistance), the thermal design (it needed to be able to survive extremely hot and extremely cold environments with its journey beginning near the sun and ending in the outer solar system), the ability to go in and come out of deep space hibernation to save on power, and the ability to navigate close to a comet and explore the comet's explosive transformation as it approaches the sun.

The oral and poster presentations will be archived on the NASA website as well as photographs taken during the workshop, <https://solarsystem.nasa.gov/missions/ippw.cfm>.



Upcoming Richard F. Barry Seminars

A lineup of our Fall 2015 speakers:

Sept. 3, Xianyi Zeng, Duke U.
Sept. 17, Phil Morrison, U. Texas at Austin
Sept. 30, Stephen Morris, U. Toronto
Oct. 8, Ivan Ash, ODU
Oct. 15, Boris Diskin, National Institute of Aerospace
Sudip Sen, National Institute of Aerospace
Michelle Danaher, ODU

Anyone who has suggestions for the fall and Spring seminar speakers, contact Fang Hu @ fhu@odu.edu

Undergraduate & Graduate Program

Graduate and Undergraduate Programs: The annual Math Awareness Conference was held in April hosted by the ODU Student Chapter of SIAM. The conference was attended by approximately 50 scientists all across the Tidewater region. Dr. Kannan of the NSF was one of the keynote speakers.

Dr. Noren supervised a group of undergraduate students for the annual Putnam Exam competition. The William Lowell Putnam Mathematical Competition is administered by the Mathematical Association of America. There were 4,320 contestants and this was the first year that our Math/Stat department ODU Putnam team score ranked it as a 'named' team; ranking 148 out of 577 participating institutions. Congratulations **Charles Armstrong, Seth Bright** and **Richard Kitt**

Dr. Lasseigne has been working with Drs. Whittaker, Duffy and Anderson to enhance the department's commitment and involvement in the MonarchTeach. He is developing Math 375: Advanced Concepts for Secondary Educators: Functions and Modeling as part of this program and it is scheduled to be deployed in the spring 2016

Ms. Flanagan gave a lecture to the freshmen class as part of The First Class Lecturers Series. Thanks Robin for your dedicated work to advance the good will of the department and to promote the academic goal of the university.

Mathematical & Statistical Department

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