DEPARTMENT OF MATHEMATICS AND STATISTICS

Summer EDGE Program

by Raegan Higgins

This past summer Texas Tech University hosted the Enhancing Diversity in Graduate Education (EDGE) summer session. EDGE, co-directed by Raegan Higgins, an associate professor at Texas Tech and Ami Radunskaya, professor of mathematics at Pomona College and immediate past president of the Association for Women in Mathematics, is a national program that focuses on increasing the number of women and minority students who successfully complete graduate programs in the mathematical sciences. EDGE is in its 20th year.

In recent years, the summer session has been hosted at universities across the country. When Higgins became co-director in 2017, she knew she wanted Texas Tech to host the 2018 cohort of EDGE and began working with the Office of the President, the Office of the Provost, the Graduate School, the Division of Diversity, Equity & Inclusion, and the STEM Center for Outreach, Research & Education to make it a reality.

EDGE, originally the Spelman-Bryn Mawr Summer Mathematics Program, began to prepare participants for the transition into their first year of doctoral studies. As the program grew, leaders expanded mentoring and networking services in order to provide ongoing support as participants continue their academic and professional journeys. EDGE now consists of two basic components: the intensive summer program and a follow-up mentoring program.

Each summer session consists of four courses, with two taught the first two weeks and two taught the second two weeks. Each year also includes a mini-course focusing on another important area of mathematics, as well as "difficult dialogues," a mini-course that focuses on issues and challenges the participants may face outside of mathematics.

See ***EDGE*** inside.

IN THIS ISSUE

2018 PUBLICATIONS

107 refereed publications

books/book chapters: **20**

17 Refereed Conference Proceedings/Presentations

EDGE

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The 2018 cohort included one Texas Tech alumna and 13 others from 12 institutions studying a variety of mathematical areas, including applied mathematics, pure mathematics, statistics and topology. Of three mentors, one is a Texas Tech mathematics doctoral student.

The students began the summer session by studying and working problems in linear algebra and real analysis. Those were covered for the first two weeks. The final two weeks focus on measure theory and machine learning. The courses were led by Texas Tech professor Angela Peace, Radunskaya, Dickinson College professor Sarah Bryant and Leona Harris, a professor from the University of the District of Columbia. Texas Tech professor Victoria Howle lead the mini-course.

"We really push hard for a lot of problems turned in because this is one of the rare chances, they will have to get actual feedback with no grades on how they are writing proofs," Radunskaya said. "There's this quantum leap between the expectation in undergraduate studies and graduate school. All of the sudden you're supposed to know how to do that like a pro, and where do you learn that?"

The collaborative effort in class among EDGE participants is one of the first steps in building another aspect that is essential to their continuing success.

"You start building your math community without even really knowing it," Higgins said. "When students first arrive, they may just think, 'I need to get through these four weeks,' and they don't realize the benefits until later. You have collaborators for life, even after you finish your degree."

Higgins said this network is especially important for students completing their doctoral studies at an institution different from where they completed their undergraduate degree.

"Your fellow undergraduates have had a similar experience, but now you're going to a new place for graduate school, and you don't necessarily know these people," she said. "With EDGE, you have a group of women who have had a similar, graduate-like experience with you, so you already have a resource, a community or support system, in place before you embark upon graduate school. To me, that's a huge benefit."

The network includes more than just the students and faculty in the current summer session. During the summer session, a reunion conference is held during the weekend at the midpoint of the program. The purpose of the conference is two-fold: members of the previous year's cohort share personal and academic experiences after their first year in graduate school with the current participants, and EDGE faculty can address any issues the previous cohort may experience as they prepare for their second year.

As an EDGE participant in 2002, Higgins has experienced the benefits of the program firsthand. The people she met as a student have become her fellow collaborators when it comes to teaching and research. Some, like Radunskaya, who led one of the courses Higgins completed in EDGE, have become more than mentors.

For more information on the EDGE program, visit www.edgeforwomen.org.

XVII Red Raider Minisymposium

by Giorgio Bornia

The Red Raider Minisymposium is by now a tradition in the Department of Mathematics and Statistics. This series was initiated in 2001 by Prof. Frits Ruymgaart, a Paul Whitfield Horn Professor, who generously used his professorship's endowment to fund the minisymposium activities. Since 2015, Horn Professor Linda Allen continues this line of funding with the same generosity.

The 17th edition took place on October 27, 2018, and was entitled "Current Trends in Numerical Analysis and Scientific Computing". The goal of the minisym-posium was to bring together top scientists in the areas of Numerical Analysis and Scientific Computing to understand the most important lines of investigation in these fields. The event was also an occasion for both students and researchers in these fields to exchange ideas about future research directions. The minisymposium featured ten invited speakers, five of which being distinguished, internationally recognized experts (Wolfgang Bangerth, Jean-Luc Guer-mond, Max Gunzburger, Fengyan Li, Beatrice Rivière), the other five being promising early-career young scientists (Sara Calandrini, Giacomo Capodaglio, Diane Guignard, Alexander Mamonov, Lin Mu). The speakers work in top-level universities and research institutes (Colorado State University, Texas A&M University, Florida State University, Rensselaer Polytechnic Institute, Rice University, University of Houston, Oak Ridge National Laboratory). Their talks featured an interplay of both theoretical and practical aspects that are at the forefront of current research efforts in the scientific community. The lectures exposed the audience to research problems from a broad span of topics, such as finite element methods, adaptivity, reduced-order modeling, and stochastic partial differential equations. Several applications of these methods were presented, ranging from fluid dynamics to electromagnetism, from geology to ocean modeling, from imaging to porous media flows. More than thirty participants took part in the event, both from the student and from the faculty community. The coffee breaks as well as the lunch and dinner times were very enjoyable moments. We are sure that the invited speakers and all the participants will remember this event for the very high quality of the talks and for a joyful sunny day. The organizers, Giorgio Bornia and Wei Guo, would like to thank again for the support offered by the sponsor, TTU Horn Professor Linda Allen, as well as by the Department of Mathematics and Statistics and by the TTU SIAM Chapter.

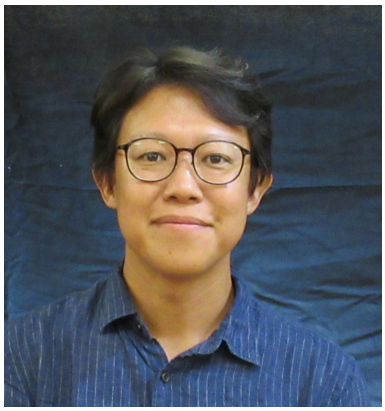
Welcoming New Colleagues

Dr. Chunmei Wang
Assistant Professor

Her research focus includes Applied Mathematics, Differential Equations, and Computational Mathematics.

Yancy Nuñez
Undergraduate Program Manager

He aids in developing curriculum and program catalogs as well as recruits, advises, and instructs undergraduates.



Dr. Jiho Park
Postdoc

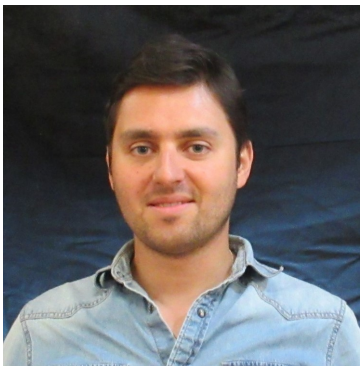
His research focus is in Financial Mathematics and his main mentor is Dr. Zari Rachev.

Dr. Davide Lauria
Postdoc

His research focus includes Statistics and Financial Mathematics and his main mentor is Dr. Alex Trindade.

Dr. Cezar Lupu
Postdoc

His research is in Pure Mathematics, special functions and his main mentor is Dr. Razvan Gelca.



Dr. Phuong Nguyen
Postdoc

Her research focus includes Stochastic Partial Differential Equations and Statistical Analysis.

Emmy Noether High School Mathematics Day

by Angela Peace

Many female students from five local high schools (grades 9-12) and their teachers gathered together to attend the 16th Emmy Noether High School Mathematics Day on May 16, 2018. It was an event packed day with student and teacher workshops, a competition, lunch, career panel, and an award ceremony. Going strong for 16 years, the Emmy Noether High School Mathematics day at TTU has provided women students with a unique, high-quality experience designed to foster interest in mathematics and careers in mathematics, engineering, and science. The women get the opportunity to experience a university environment and witness that careers in mathematics, science, and engineering are attainable. This event continues to foster exceptionally talented students while exposing female students to successful women in Mathematics. For more information visit the website at http://www.math.ttu.edu/~enoether.

SIAM News

By Ramesh Kesawan

The TTU SIAM is a graduate student organization affiliated to the department of Mathematics and Statistics at Texas Tech University and it is one of the student chapters of the Society of Industrial and Applied Mathematics (SIAM). The primary focus of this chapter is to promote applied and computational mathematics to young mathematicians and scientists around the world.

We believe that the participation of students and faculty from a variety of departments provides invaluable opportunities to develop networks with faculty members outside of the classroom, share ideas and research with people with similar interests, learn about career options, and develop leadership skills. Therefore we organize numerous academic events like colloquium, symposium, and career talks, to stay in touch with the latest research trends and get to know researchers expanding our professional networks.

During the month of March we organized three colloquia, including a talk by Dr. Pavel B. Bochev, who is a Distinguished Member of the Technical Staff at Sandia National Laboratories in Albuquerque.

The travel funding we provided through the years has helped many graduate student members attend conferences all over the country, alleviating the burden of registration fees and expensive airfares. Only last year, TTU SIAM awarded thousands of dollars for travel reimbursement and this year we expect to be giving no less than last year's amount.

TTU SIAM is also a good promoter of social events to improve social interaction among its members and faculty. Every fall, we organize a Thanksgiving Luncheon for the department, while in the spring we organize a departmental picnic along with a barbecue event. Many other events are usually organized, such as movie nights and bowling socials.

In conclusion, anyone who is interested in getting involved with TTU SIAM is very welcome to contact any officer to gather information on membership application and upcoming events.

Dr. Eugenio Aulisa is the SIAM faculty advisor.

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Society for Industrial and Applied Mathematics

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Spring 2019 departmental picnic organized by SIAM.

Undergraduate Student Organizations

MAA
MATHEMATICAL ASSOCIATION OF AMERICA

The Texas Tech Student Chapter of the Mathematical Association of America (MAA) has restructured to become a Departmental Member of MAA under departmental chair Magdalena Toda as liaison. The restructured MAA chapter makes it easier to students to take advantage of the benefits offered by MAA. The organizations continue to provide encouragement in the mathematical sciences as well as social activities for our undergraduate math majors and minors.

The Undergraduate Math Club also remains active providing financial and social support for our undergraduate math majors and minors. Giorgio Bornia continues as the Math club faculty advisor.

AWM Raiders Student Chapter

By Nadeesha Jayaweera

The Raiders Chapter of the Association for Women in Mathematics is an undergraduate and graduate student organization affiliated with the international AWM organization, whose goal is to encourage women and girls to study and have active careers in the mathematical sciences, and to promote equal opportunity and treatment of women and girls in the mathematical sciences.

As a new registered student organization, we are planning to share more research-based activities among the members by organizing colloquiums and other academic activities. Travel funding will be given to both undergraduate and graduate as an encouragement to attend conferences to improve their research based knowledge and also to connect with the world by reducing their travel expenses. Awarding scholarships will be a great opportunity to reduce their burden of tuition fees and other expenses as a student. Last fall, we organized an informal discussion with panelist of successful woman in Mathematics from the Department of Mathematics and Statistics at TTU to encourage members in the field of Mathematics. On the other hand, many social activities such as potluck luncheon, ice-cream socials, picnics and other social activities are organized throughout the year to improve the social interaction among the members.

The AWM Raiders faculty advisor and the co-advisor are Dr. Angela Peace and Dr. Raegan Higgins respectively. Finally, anyone who is not yet joined with AWM Raiders is very warmly welcome to contact any officer to gather information on membership and any other upcoming events hosted by AWM Raiders.

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Vice Pres.:	Xueting Xia, xueting.xia@ttu.edu
Secretary:	Lale Asik, lale.asik@ttu.edu
Treasurer:	Nadeesha Jayaweera, jayaweera.imiya-mohottige@ttu.edu

Upcoming Events

17th Emmy Noether High School Mathematics Day

May 15, 2019

Students from local high schools will gather once again for the 17th annual Emmy Noether High School Mathematics day on May 15, 2019. Workshops for students will include a variety of topics from the mathematics in music to parallel lines in projective geometry to computational modeling of zombie outbreaks. Additional workshops will be held for teachers. Other events of the day include a mathematics competition, career panel, lunch, and an award ceremony.

TexPREP Summer Program

May-July, 2019

TexPREP (Texas Pre-Freshman Engineering Program) is a summer program for sixth through twelfth grade students, consisting of seven-week sessions over four summers. The Texas Tech University Department of Mathematics and Statistics has hosted it since 1986. This challenging academic program designed to motivate and prepare middle and high school students for success in advanced studies leading to careers in science, technology, engineering or mathematics fields will be held this upcoming May through July. Both undergraduate and graduate math majors at Tech work for the program. Some of them plan to be teachers, so they gain valuable experience while helping the students.

Scientific Computing meets Machine Learning and Life Sciences

October 7-9, 2019

A variety of challenges in scientific computing on machine learning related to problems in the life sciences have emerged in recent years, and TTU will host a workshop to bring together a diverse group of scientists working in various areas of computational mathematics, statistics, computer science and life sciences to advance the state-of-the-art statistical analyses for machine learning in the life sciences, and to further develop mathematical and computational methods in these rapidly developing fields. The workshop will consist of presentations, posters and group discussions which will stimulate an intensive exchange of ideas, foster fruitful interactions, identify challenges, promote interdisciplinary collaborations and initiate joint research projects. Chunmei Wang is taking a lead as a member of the scientific committee and Linda Allen and Jingyong Su are part of the organizing committee. See the website for more information http://www.math.ttu.edu/scmlls2019/.

Graduate Degree Recipients

May 2018

PhD
Dhanamalee Bandara
Sara Calandrini
Giacomo Capodaglio
Krystin Huff
Sanjeewa Karunarathna
Simon Rush
Wei Zhang

MA
Ronald Moreland
Emily Stamm

MS
Ann Almeida
Beyeong Ho Ban
Casey Brito
Neranjaka Jayarathne
Nilan Manoj Chathuranga Kasisetti Mudalige

STAT
Malima Atapattu
Yao Fu
Audrey Gill

August 2018

PhD
Roshan Adikari
Benoit Ahanda
Ameen Alhassan
Hum Bhandari
Josh Engwer
Purna Gamage
Quan Hoang
Xiaochuan Hu
Bimali Jayasinghe
Farzana Nasrin
Pushpi Paranamana

MA
Douglas Beeman
Traci Mayo

MS
Brandon Finney
Allison Godwin
Rohan Korde
Md Masud Rana
Michael von Ende-Becker
Monir Uz Zaman

STAT
Roham Sabzevari
Ahmed Sabit
Qiannan Zhai

December 2018

PhD
Pansujee Dissanayaka
Manjari Dissanayake

MS
Md Shah Alam
Amin Nikakhtar

STAT
Ahmed Belhad
Mai Dao

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