

From the Chair (Dr. Cristina Mariani)

Dear Alumni and Friends:

I am very happy that it is the time of the year to be writing to you again, and I hope you and your families are doing well. We had another great year for our Mathematical Sciences Department.

Last year I communicated to you that UTEP would host for the first time on the UTEP campus an American Mathematical Society (AMS) meeting on September 17-18, 2022. About 300 participants enjoyed this vibrant meeting hosted on the beautiful UTEP campus (see story on this page).

One year after launching the new doctoral degree in Data Science, the program has 43 students (see story this page) and in fall 2022 we began offering the following new programs in Data Science: undergraduate concentration and minor in Data Science, Fast Track from B.S. Math to Ph.D. Data Science and M.S. in Statistics and Data Science. We anticipate the launch in spring 2023 of the new undergraduate course SCI 1301 Data and Society.

Our Alumni and Friends have been especially supportive of our new programs. During 2022 Homecoming Week, Dr. Frank Hsu visited UTEP and presented a talk in our colloquium. He also met with and advised our Data Science students and other graduate students from our Department.

This year I am delighted to welcome several important hires of assistant professors: Dr. **Ritwik Bhattacharya** (who will support our Data Science and Statistics programs) as well as Dr. **Anass Bouchnita** and Dr. **Jonathan Mohl** (who will support our Bioinformatics and Data Science programs). We are grateful for the service of **Valerie Domínguez**, who recently concluded her 6 years of excellent service as office supervisor for us.

I am also very proud to report that our faculty and staff continued their outstanding job adapting to the pandemic, by offering not only our traditional face-to-face courses, but also offering hybrid or online classes to meet the needs of students who need their flexibility. The Department continues to grow, with the last 5 years yielding nearly 300 peer-reviewed publications and books, and \$63 million in grants. As UTEP has a distinctive Hispanic population of future data science professionals, our new PhD and other programs in Data Science will play a crucial role in closing the gap for a minority currently underrepresented in the field.

All these achievements are possible only with the hard work of our faculty and staff, the strong support from our administration, and the generosity of Alumni and Friends like you. As you know, the UTEP Data Science and Informatics Gift Fund was established in 2019 by UTEP Distinguished Engineer Allen Gilmer and Math Department alumnus Frank Hsu, Ph.D., Clavius Distinguished Professor of Science at Fordham University in New York, *Continued on page 5*

In This Issue ...

- **Chair's Column**
- **UTEP, AMS Make History**
- **Data Science Program Thrives**
- **AMS Student Chapter Grows**
- **Student News**
- **Dr. Marcus' 42 Years at UTEP**
- **Alumni Spotlight**
- **WebWork Homework**
- **Inflection Points**

UTEP, AMS MAKE HISTORY WITH MEETING

The AMS (American Mathematical Society) held its first-ever meeting on our campus with the Fall Central Sectional Meeting on September 17-18, 2022. This was also the first in-person AMS meeting after the start of the pandemic, and the first that included some virtual talks (to allow broader participation). This sectional meeting had originally been scheduled to be held at UTEP two years earlier, but due to the pandemic was held online as the AMS' first-ever virtual conference (see front-page story in [MAXIMA 2020](#)).

The meeting's approximately 300 attendees from multiple states and countries included many UTEP faculty who gave presentations and/or organized sessions as well as 11 UTEP students who gave research presentations. Other talks were given by UTEP alumni such as the plenary talk "Measuring Spatial Access to Community Amenities and its Association with Health" by Dr. Brisa Sánchez (B.S. in Mathematics and M.S. in Statistics from UTEP), an ASA Fellow who is the Associate Dean for Research and the Dornsife Endowed Professor of Biostatistics at Drexel University. The program is available at www.ams.org/meetings/sectional/2297_program.html.

Continued on page 4

DATA SCIENCE Ph.D. PROGRAM THRIVES

One year after its full launch (see front-page story in [MAXIMA 2021](#)), the department's first Ph.D. program is off to a great start, with new courses, 43 students (including 12 part-time students and 11 Research Assistants), and several related grants that help support the students. Two students have already completed applications for candidacy, others are close behind, and the first graduates are expected in 2023.

The program is also supported by physical resources, ranging from the Data Analytics Lab (see page 3 photo in [MAXIMA 2021](#)) to the Bell Hall 100 suite of offices reconfigured this year for our PhD students so they are able to work in small groups throughout the day and evening. For more information, contact program director Dr. Amy Wagler at awagler2@utep.edu or associate director Dr. Azucena Zamora at azamora3@utep.edu or visit www.utep.edu/science/math/academic-programs/graduate/datascience.html.



STUDENT NEWS



Andrews T. Anum (right) and research advisor Dr. Michael Pokojovy. Photo: Honglun Xu

CPS Ph.D. student **Andrews T. Anum** (CPS Ph.D. Program) and his research advisor Dr. **Michael Pokojovy** received a best-paper award from [The Southwest Data Science Conference 2022 at Baylor University](#) for their paper "A Fast Initial Response Approach to Sequential Financial Surveillance."

Data Science Ph.D. student **Md Easin Hasan** recently accepted a full-time Machine Learning Scientist position at the U.S. Food and Drug Administration.

Paola Garcia Hernandez, who minored in mathematics, was named one of [UTEP's 2022 Top Ten Seniors](#).

Statistics and Data Science M.S. student **Michael Orosz** recently accepted a full-time Data Scientist position at GECU.

ACADEMIC AND RESEARCH EXCELLENCE AWARDS AT COLLEGE OF SCIENCE PRE-COMMENCEMENTS

Fall 2021:

Mathematics - **Brandon Lee** (undergraduate)

Spring 2022:

Mathematics - **Kelzang Jjigme** (undergraduate)

Mathematics - **Oula Khouzam** (graduate)

Statistics - **Denisse Urenda** (graduate)

AMS STUDENT CHAPTER GROWS

UTEP's Student Chapter of the AMS (American Mathematical Society) that launched last year (see [MAXIMA 2021](#)) continues its growth, with membership increasing from 16 to 42. According to current president Ebenezer Nkum, the chapter currently aims to: explore collaborations with the Data Science Section from SIAM (Society for Industrial and Applied Mathematics), influence courses taught in the department, have each member attend (and present at) a conference, and provide training in SQL projects, publications, conferences, presentations, and internships. UTEP undergraduate or graduate students in any field with interest in mathematics may join the chapter at minetracker.utep.edu/organization/amsgc.



DR. MARCUS CELEBRATES 42 YEARS AT UTEP

Dr. Nancy Marcus was honored at a May 11, 2022 retirement reception hosted by the College of Science honoring her 42 years of service. In addition to being one of the longest-serving members in department history, she also showed great leadership for the College of Science, serving as its Associate Dean for Academic Programs and Student Success since 2004.

Dr. Marcus progressed through the ranks in our department – from Lecturer to Full Professor – while becoming the first in our department's history to win these statewide teaching awards: a University of Texas System Chancellor's Council Award for Outstanding Teaching (1998) and a Minnie Stevens Piper Professor Award (2003).

A passionate long-time advocate for student success in STEM fields, she helped launch our department's fast-track programs (B.S. to M.S. Math; B.S. to M.S. Stat; and B.S. to Data Science Ph.D.) and certificate programs (Applied and Computational Mathematics; Applied Statistics; Big Data Analytics). Over the years, she also helped implement and improve many multi-section courses, including college algebra, trigonometry, pre-calculus, and calculus. She also pioneered online versions of our Calculus I and Calculus II courses and will continue to teach these courses part-time for the Department during her retirement, yet further reflection of her endless dedication.



Department faculty and staff at Dr. Marcus' celebration. Left to right: Laura Olivas, Dr. Cristina Mariani, Dr. Joe Guthrie, Dr. Nancy Marcus, Dr. María Barraza, Dr. Pía Beccar-Varela, Dr. Luis Valdez-Sánchez. Photo: Dr. Gail Arnold

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ALUMNI SPOTLIGHT

Editor's Note: Raul Higuera, a past vice-president for our student chapter of AMS, graduated with an MS in statistics in spring 2021. This update, shared with permission from a January 31, 2022 email to Dr. Wagler, should inspire current and future students. Let us know if you would like to be featured in a future issue of Maxima or on the department website.



Raul Higuera
M.S. Statistics, 2021

I was offered a position as an Associate Data Scientist at the FedEx Express World Headquarters in Memphis, Tennessee!

Now I will do my best to backtrack and detail my path to receiving their offer. I graduated with my master's degree in statistics back in May 2021. After graduation, my time consisted of applying to countless number of jobs and receiving just as many rejections. Not everything was bad

news, however. Near the end of June, Dr. Rosen was kind enough to allow me to assist him on one of his research projects.

Fast forward to October, when we attended the talk given by EVP/CEO Aviation-FedEx Express, Scot Struminger. I approached Mr. Struminger at the end of the meeting to thank him for his time and delivered him my elevator speech. That same day he received a lengthy email including my resume, and reasons why I would be a great fit to FedEx. Discouraged for not receiving a response after two weeks, I began surfing the web again for jobs. And like always, when one least expects it, I received his email. He thanked me for my kind words and highlighted skills I possessed he believed would suit FedEx. He forwarded my resume to his team and from there I was reached out to by Corporate Development Manager at FedEx Express, Janet Wilson.

Janet and I began a series of phone call meetings to get familiarized with my background and the role of a data scientist at FedEx. Convinced of what I had to offer, Janet scheduled me for a formal phone screening with her and another manager from a different department. The interview consisted of questions assessing

my knowledge of programming languages (R, Python, SAS), machine learning algorithms, and data visualization. You can imagine my excitement when I received an email inviting me to the final phase of the hiring process: behavioral interview. I knew it was not over, especially since I was going up against two FedEx employees interviewing for the same position. The behavioral interview was tough. The interview was hosted by Janet and two other department managers and consisted of eight questions ranging from application of skills to projects, behavioral scenarios, implementing Natural Language Processing to serve FedEx Express. There were times where I froze, stuttered, and asked more than twice if they could repeat their question. But there were also times where I demonstrated creativity and initiative and delivered my responses in a confident and concise manner. I even managed to get a laugh or two out of them! All in all, I was drained after the interview. Months seemed to be jammed into days while I awaited their decision. Finally, four days after my interview, I was offered the position. I could not believe it. But then I did. All the nights spent studying for exams, doing research, being rejected for jobs, and so on, equipped me with the tools necessary to excel anywhere. I owe a lot of this to the teachers and students that make UTEP exceptional.

I was offered a position as an Associate Data Scientist at FedEx Express in Memphis, Tennessee. My responsibilities are still quite vague, but one of the objectives in our department is to use machine learning to predict fuel consumption from their aircraft fleet. I would be happy to let you know more about my responsibilities once I begin working.

I hope my story helps to motivate students or recent graduates to not get discouraged when trying to find a career and to not neglect the power of networking. Just another reason to attend colloquia!



MAKING HOMEWORK WeBWorK

The open-source online homework system WeBWorK (openwebwork.org; sponsored by the MAA and NSF) has been adopted in several higher-level mathematics courses, thanks to Dr. Julio Urenda's Provost's Office-supported project launched in Summer 2022 to improve retention rates and learning outcomes.

During the COVID-19 pivot to online teaching, Dr. Francisco Avila was an early adopter of WeBWorK and he and his students found it to be easy to learn, extensible, and highly customizable – a nice counterpart to commercial online homework systems used in freshman-level Math courses. Urenda and Avila presented a session about their experience at the 2022 CFLD conference at UTEP.

In fall 2022, several sections of Discrete Mathematics, Calculus II, Matrix Algebra and Differential Equations are using WeBWorK. Students surveyed in summer and fall 2022 rated highly the system's immediate feedback, the ability to retry assignments, and that the platform is free to use. Faculty using WeBWorK find the existing database of questions more than adequate for the classes they are teaching, with varied types of questions available (interactive questions as well as traditional multiple choice and fill-in-the blank), and a high level of customizability. Even with most classes back to face-to-face instruction, this system continues to offer many advantages and additional adoptions are expected in the near future.

UTEP, AMS MAKE HISTORY WITH MEETING *(from page 1)*

Each year, the AMS typically hosts (with more than a dozen other organizations) the Joint Mathematics Meetings (the world's largest annual mathematics research meeting with some 6000 attendees) as well as a Sectional Meeting in each of four geographic regions (Central, Eastern, Southeastern, and Western).



Plenary speaker and UTEP alumna Dr. Brisa Sánchez (right) with Dr. Helmut Knaust, who introduced her talk. Photo: Dr. María Barraza



Left to right: Plenary speaker Dr. Caroline Klivans with long-time collaborators Dr. Art Duval, who introduced her talk, and Dr. Jeremy Martin. Photo: Dr. María Barraza.



Left to right: UTEP Provost Dr. John Wiebe, plenary speaker Dr. Brisa Sánchez, department Chair Dr. Cristina Mariani, College of Science Dean Dr. Robert Kirken. Photo: Dr. Pía Beccar Varela



Department staff assisting in meeting registration. Left to right: Laura Olivas, Valerie Domínguez, Dr. Azucena Zamora. Photo: Dr. Cristina Mariani.



Special Session on High-Frequency Data Analysis, Complex Datasets, and Applications. Photo: Kwesi Appau.



Special Session on Ordered Structures participants visiting downtown El Paso. Photo: Dr. Warren McGovern.



INFLECTION POINTS



(See math.utep.edu for other accomplishments too numerous to list!)

Dr. **Behzad Djafari-Rouhani** received an NSF-AMS travel grant of \$4100 to participate in the International Congress of Mathematicians in July 2022 in St. Petersburg, Russia.

Dr. **Helmut Knaust** landed (as co-PI) and launched a \$1M 2-year NSF grant “LSAMP Bridge to the Doctorate.”

Dr. **Larry Lesser** was a winner in national STEM education competitions (including the Activity Contest for the Electronic Conference on Teaching Statistics), co-led (with lecturer **Samantha Patterson**) a funded major revision of the department’s largest course (MATH 1320), gave a keynote at the 2022 NNN conference, and wrapped up a small grant to fund an international speaker series and associated scholarship by a UTEP graduate student. He co-chaired the 2022 international VOICES conference, and at the 2022 UTEP CFLD Conference, he was a plenary panelist and was honored for years of leadership and contributions to UTEP faculty development.

Dr. **Abhijit Mandal** landed as Co-PI a \$2.25M 5-year NIH grant “Benzene exposure promotes neuro-inflammation and metabolic dysregulation.”

Drs. **Maria C. Mariani** and **Michael Pokojovy** landed (as PI and Co-PI, respectively) a \$732K 3-year DoE grant “Developing Evidence-Based Learning Environment for Success in STEM: Increasing the Retention of Minorities and Women” in collaboration with researchers at TAMUCC.

Dr. **Michael Pokojovy** landed and launched as PI a \$120K 3-year NSF grant “Nonparametric total variation regression for multivariate process data” as well as several grants as a co-PI – a \$1M 3-year Department of Education grant (“Developing Modeling and Simulation Based Engineering Learning Environment for Capacity Transformation in Higher Education”), a \$300K 3-year NSF grant (“Improving student engagement and training in healthcare engineering with advanced data-analytics solutions”), and a \$70K 1-year NSF grant (“Charging station of the future: operation and management”).

Dr. **Natasha Sharma**, promoted this year to Associate Professor with tenure, landed (as co-PI) and launched a \$44K DOE ASCR 1-year grant “Broadening National Science on Advanced Modeling and Simulations” and a \$5M DOE NNSA/MSIPP 5-year grant “The Rio Grande Consortium for Advanced Research on Exascale Simulation”.

Dr. **Amy Wagler**, promoted this year to Professor, landed (as co-PI) and launched a \$613K 2-year NIH grant to study the effect of electrical stimulation to increase glycemic control in Mexican-Americans. Wagler also co-led a team which published stunning [community-engaged research](#) on food and housing insecurity among UTEP students in *Journal of Hunger & Environmental Nutrition* and in *Frontiers in Public Health*.

Dr. **Son-Young Yi** landed (as PI) and launched a \$250K 3-year NSF project “Physics-Preserving Adaptive Finite Element Methods for Thermo-Poroelasticity,” a computational mathematics grant supporting the development of enhanced systems for geothermal energy.

From the Chair *(from page 1)*

a 2019 UTEP Gold Nugget, and a founding father of Big Data. The Professor Eugene Alan Dean Memorial Endowed Scholarship was established; Ron Hagquist and Yvonne Lanelli have established the Hagquist-Lanelli Student Success Scholarship, and the Hagquist-Martinez Student Excellence; and the Carmen and Agustin Flores Morales Student Excellence Endowment was recently established.

Please take the opportunity to advance student success, our field, and society. I encourage you to make your contributions to any of these recently established Scholarship Funds and our other Scholarship funds benefiting our students, listed on the next page. Your donation will be of great help to support the recently launched programs in Data Science, including our Ph.D. program, and our other programs, and our Excellence Fund that supports student travel to meetings and other items not covered by our budget. There are numerous existing funds available for additional support, or you can easily establish your own fund or endowment by contacting **Annaelisa Holguin**, College of Science Director of Advancement, aholguin33@utep.edu. As a former student, you will always be part of our heritage, and you can be part of our future by participating and collaborating in any of the many possible ways. Feel free to contact us with your ideas at mathdept@utep.edu, 915-747-5761.

Finally, I thank our Dean, Dr. Kirken, for his invaluable and continuous support to our Data Science programs, and for helping the College and the Department achieve excellence in research and teaching to support the new strategic plan for America’s leading Hispanic-Serving University, and help UTEP become and remain one of the most successful Hispanic-serving Institutions with the R1 designation by the Carnegie Classification of Institutions of Higher Education.

Stay safe and Go Miners!

Alumni Data Update Form - *Keep in touch!*

Online form at www.utep.edu/science/math/foralumni/

Name (please print): _____

Name while at UTEP, if different: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone Home: _____ Email Address: _____

Degree(s) and Major: _____ Year(s): _____

Employer: _____

Position/Title: _____

Let us know what you have been up to (and whether we have your permission to be included in the department newsletter, Facebook page or website):

Donation Form

Yes, I want to support the Department of Mathematical Sciences!

Online form at givingto.utep.edu/math

Enclosed is my gift in the amount of \$_____ for:

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| <input type="radio"/> Lawrence "Larry" and Katsuko "Kitty" Huntley Endowed Scholarship | |

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