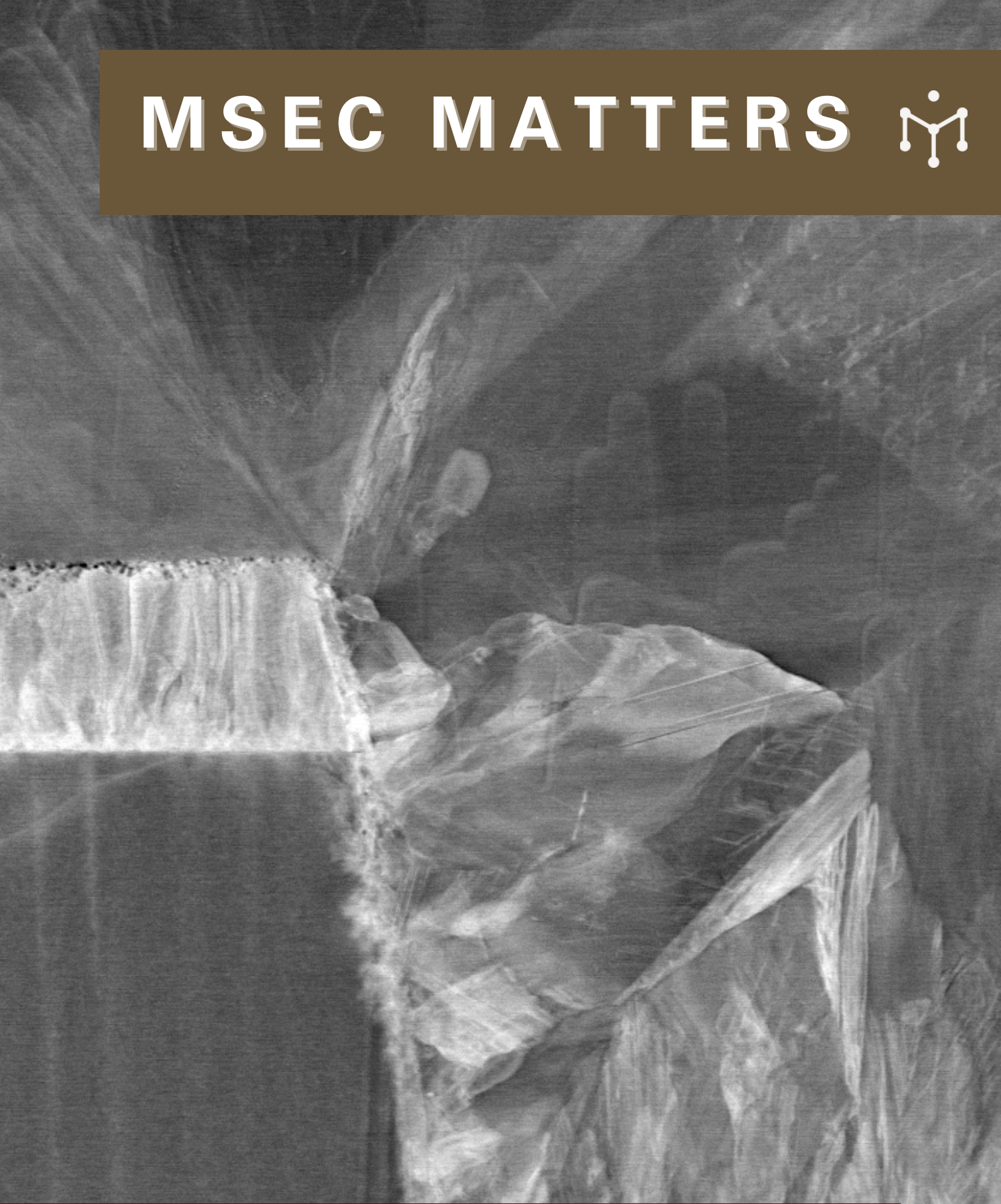
MSEC MATTERS



TEXAS STATE UNIVERSITY
ISSUE IV • FALL 2022

STEM image showing diamond selectively grown in a trench etched into AlN/Si
Provided by Dr. Jon Anderson and Dr. Edwin Piner

In This Issue

LETTER FROM THE DIRECTOR

In our last MSEC Matters, we reported on the tenth-year anniversary of our program. As 2022 comes to a close, we look back on the past year and share exciting news about the future of MSEC in 2023 and the decades beyond.

Over the past year, MSEC faculty have been very productive in enhancing the excellent resources that are available to MSEC students. While the award to our university of one National Science Foundation (NSF) Major Research Instrumentation (MRI) award is newsworthy, this Fall two MSEC faculty were awarded MRI grants: Dr. Karen Lewis was awarded an MRI to purchase an automated isothermal calorimeter system and Dr. Wilhelmus Geertz was awarded an MRI to construct a triaxial vibrating sample magnetometer. In addition to these NSF-funded initiatives, the Materials Application Research Center (MARC) funded a proposal by Dr. Christopher Rhodes to purchase an inductively-coupled plasma mass spectrometer. These new instruments will greatly enhance our program by providing new capabilities, and we are grateful to these outstanding MSEC faculty and MARC and NSF for their support.

As we look forward to 2023 and beyond, I am excited to share with you plans for a major expansion of MSEC. Through very generous new, additional funding by the university, MSEC will now be able to offer more Assistantships for students, which means we can significantly increase the size of the program. Along with these new positions, we have implemented Spring and Summer admissions in addition to our normal offers of Fall admissions. These changes do come with a challenge, as we must now increase our recruitment efforts. I hope all MSEC students, faculty, alumni, and supporters will help us spread the word about MSEC to promising MS-level candidates and refer them to our web site for information on how to apply: msec.txst.edu.

The bottom line is that MSEC is expanding, both in numbers of students and resources. This is truly an exciting time to be part of MSEC, and I am grateful for the opportunity to direct such a vibrant and growing program.

Sincerely,

Dr. Sean Kerwin

Student Awards

- **Samuel Kimmel was awarded the Doctoral Research Support Fellowship**
- **Farah Najdawi was awarded the Graduate College Scholarship**

Student Publications

Danish, Aamar, Mohammad Ali Mosaberpanah, **Muhammad Usama Salim**, Mugahed Amran, Roman Fediuk, **Togay Ozbakkaloglu**, and Muhammad Fawad Rashid. "Utilization of recycled carbon fiber reinforced polymer in cementitious composites: A critical review." Journal of Building Engineering 53 (2022): 104583. https://doi.org/10.1016/j.jobe.2022.104583

Danish, Aamar, **Togay Ozbakkaloglu**, Mohammad Ali Mosaberpanah, **Muhammad Usama Salim**, **Muhammed Bayram**, **Jung Heum Yeon**, and Komael Jafar. "Sustainability benefits and commercialization challenges and strategies of geopolymer concrete: A review." Journal of Building Engineering (2022): 105005. https://doi.org/10.1016/j.jobe.2022.105005

Qian Meng, Rasha El-Jaroudi, Rachel White, **Tuhin Dey**, **Md. Shamim Reza**, Seth Bank, and **Mark Wistey**, "Effects of B and In on the Band Structure of BGa(In)As Alloys," accepted to J. Appl. Phys. https://doi.org/10.1063/5.0125109

Salim, Muhammad Usama, Farzana Mustari Nishat, Taekgeun Oh, Doo-Yeol Yoo, Yooseob Song, **Togay Ozbakkaloglu**, and **Jung Heum Yeon**. "Electrical Resistivity and Joule Heating Characteristics of Cementitious Composites Incorporating Multi-Walled Carbon Nanotubes and Carbon Fibers." Materials 15, no. 22 (2022): 8055. https://doi.org/10.3390/ma15228055

T. N. Ahmed, C. Belduque, **M. Y. Chen**, **J. S. Tate**, and **W. J. Geerts**, "Dynamic viscosity of strontium ferrite–nylon composite below the melting temperature," AIP Adv., vol. 12, no. 9, p. 095223, 2022. https://doi.org/10.1063/5.0098972

Tuhin Dey, **Md. Shamim Reza**, Augustus Arbogast, **Mark W. Holtz**, **Ravi Droopad**, Seth R. Bank, **Mark A. Wistey**, "Molecular Beam Epitaxy of Highly Crystalline GeSnC Using CBr4 at Low Temperatures," Appl. Phys. Lett., vol. 121, no. 12, p. 122104 (2022); https://doi.org/10.1063/5.0102093

Alumni Spotlight

Dr. Joyce Anderson

Dr. Joyce Anderson graduated in 2020 and is currently a Research Associate for the Shared Research Operations (SRO) at Texas State University. Dr. Anderson was awarded The Graduate College's Outstanding Dissertation Award in Mathematics, Engineering, and Physical Sciences in August. She will receive $1,000 and will be recognized at The Graduate College's Awards Ceremony in April 2023. Her dissertation, "Measurement of Thermal Conductivity of Gold Nanowires and Nanofilms," can be found at: https://digital.library.txstate.edu/handle/10877/15193 and more information about her award can be found here: https://www.gradcollege.txst.edu/about/news/awards/joyce-anderson.html

Faculty Awards

Presidential Distinction Award for Excellence in Scholarly/Creative Activities • Dr. Anthony Torres

College Achievement Award for Excellence in Scholarly/Creative Activities • Dr. Tania Betancourt & Dr. Xiaoyu Xue

Presidential Distinction Award for Excellence in Teaching • Dr. Mark Wistey

College Achievement Award for Excellence in Teaching • Dr. Sean Kerwin & Dr. Cynthia Luxford

College Achievement Award for Excellence in Service • Dr. Karen Lewis

Faculty Grants

Texas State University received a $250,000 grant from the National Science Foundation (NSF) for a research project titled, "Using artificial intelligence to improve the accuracy of automated pavement condition data collection."

Led by Dr. Feng Wang with MSEC Students Haitao Gong and Jueqiang Tao

Dr. Salah A. Faroughi received a $150,000 grant from the U.S. Department of Energy (DOE) for a research project titled "ESMs Latent SPace Exploration for Uncertainty Quantification and Spatiotemporal Downscaling"

Dr. Yihong "Maggie" Chen

- Additive Manufacturing Process Kits for RF Components, DOD - MDA, $340,000.00
- Electronically Scanned, Multi-band SATCOM Array, SDA, $47,000.00
- Solar Sail Integrated Antenna Technology, NASA, $65,000.00
- Chen, Yihong (Principal), Droopad, Ravindranath (Co-Principal), Stern, Harold P, Stephan, Karl, Tate, Jitendra S, Geerts, Wilhelmus J, Shi, Xijun. Acquisition of Wide Frequency Band Characterization System for Electronic Devices, Antennas, and Intelligent Materials, DOD, $548,700.00
- Aerosol Jet Printing and Evaluation of Innovative Electronic Inks, Electroninks, Inc., $19,455.00
- Emerging Low Cost Reconfigurable Electronics, Northrop Grumman, $10,000.00
- Chen, Yihong (Principal), Stephan, Karl (Supporting). Conformal, Peel-and-Stick Ferrite Waveguide Embedded in Road Striping, USDOT SBIR Phase II through Nanohmics, $125,000.00
- Preparation and Evaluation of Graphene Inks, Surgepower Materials, $3,000.00

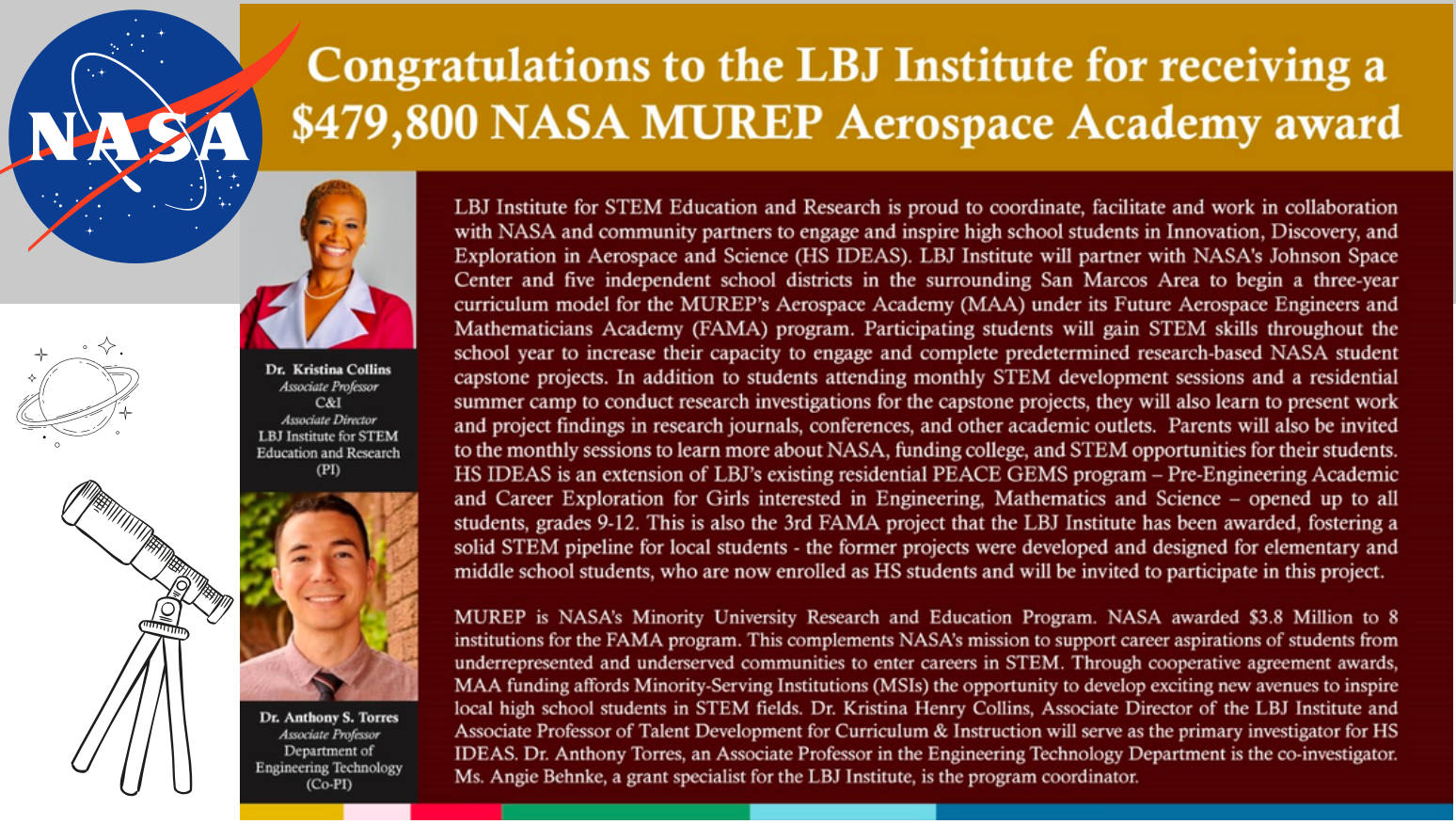
National Science Foundation

Five MSEC/Chemistry & Biochemistry faculty were awarded an NSF Major Research Instrumentation Grant, Track 1, in August 2022: Dr. Karen Lewis is PI, Dr. Sean Kerwin and Dr. Steve Whitten are Co-PIs; Dr. Ryan Peterson, Dr. Alexander Kornienko, and Dr. Xiaoyu Xue are Senior Personnel.

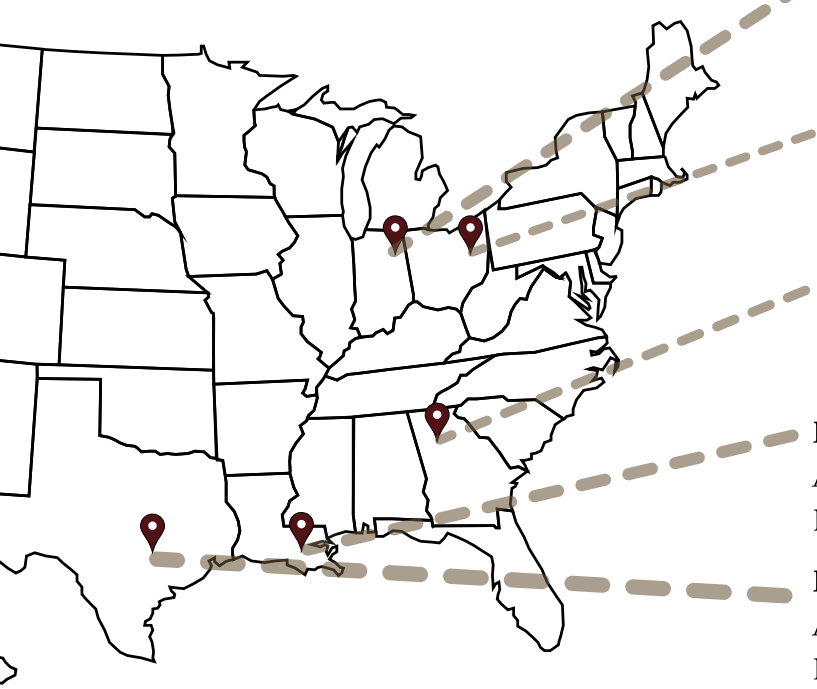
Five COSE faculty were awarded an NSF Major Research Instrumentation Grant, Track 2 in August 2022: Dr. Wim Geerts is PI, and Dr. Maggie Chen, Dr. Ravi Droopad, Dr. Chris Rhodes, Dr. Jitendra Tate are Senior Investigators, and Dr. Casey Smith is Senior Personnel.

Dr. Anthony Torres

- University Space Research Association (USRA) through the Air Force Research Laboratory (AFRL): "Understanding the Effect of Vibration in the Crystallization of Materials for Space Exploration", $350,000
- NASA, $479, 800 (see graphic below)



Welcome New MSEC Faculty!



Dr. Carlos Moro Martinez
Assistant Professor, Dept of Engineering Technology
PhD in Civil Engineering, Purdue University

Dr. Sanchul Hwang
Associate Professor, Ingram School of Engineering
PhD in Civil Engineering, University of Akron

Dr. Salah Faroughi
Assistant Professor, Ingram School of Engineering
PhD in Civil Engineering, Georgia Institute of Technology

Dr. In-Hyouk Song
Associate Professor, Dept of Engineering Technology
PhD in Electrical Engineering, Louisiana State University

Dr. Jung Yeon
Assistant Professor, Ingram School of Engineering
PhD in Civil Engineering, University of Texas (Austin)

Michael Brenton Gildner

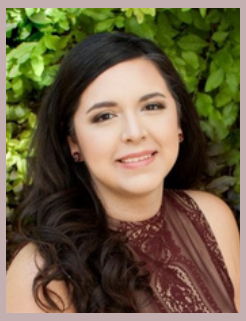
Advised by Dr. Todd Hudnall

Ikecukwu Kingsley Okechi

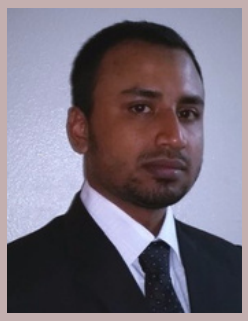
Advised by Dr. Anthony Torres & Dr. Federico Aguayo

Congratulations Graduates!

Summer 2022



Mariana Acosta
Advised by
Dr. Jennifer Irvin



Md Abdul Ahad Talkukder
Advised by
Dr. Ravi Droopad

Jueqiang Tao
Advised by
Dr. Feng Wang

Fall 2022

Haitao Gong
Advised by
Dr. Feng Wang

Bhagyashree Mishra
Advised by
Dr. Maggie Chen

Michael Gildner
Advised by
Dr. Todd Hudnall

Jesus Salvador Adame Solorio
Advised by
Dr. Chris Rhodes

CONNECT WITH MSEC

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https://www.linkedin.com/groups/6713617/

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