

# MATERIALS SCIENCE AND ENGINEERING

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MANUFACTURING

LABORATORY



**Andrey Voevodin**  
Chair

## Message from the Chair

Dear Friends,

In this newsletter, I am happy to provide you recent updates and news from our department with many exciting developments in our education and research endeavors.

Our undergraduate program has grown to over 110 enrolled students with all of our BS graduates finding exciting jobs in industry or continuing toward graduate studies at UNT and universities nationwide. Enrollment in our GradTrack pathway, a five year BS+MS fast track program for exceptional seniors, is also growing steadily, allowing some of our most talented and bright undergraduates to continue in our graduate program. Our student organizations, Materials Advantage and Society for Women Engineers, are ramping up activities at national professional events, have received a number professional awards, and are serving as great advocates for our undergraduate program.

The department's graduate program maintains a steady stream of high quality MTSE doctoral and masters graduates who find jobs in industry, academia, and national laboratories. In this letter you will find highlights of their research recognitions at professional events and international conferences. Our graduate student population of about 60 PhD and 20 MS students have published 140 peer-reviewed papers coauthored with their thesis advisors and collaborators in national laboratories and industry. We are proud to have both NSF and DoD SMART fellowship awardees among our former and current students. Because of our amazing students, we lead as the most research productive departments in the university, supporting UNT's Carnegie Tier One Research Institution designation.

Our research portfolio is spanning from structural alloys and composite materials to materials for sensors, optoelectronics, energy conversion, medical implants, radiation resilient glasses, wear, corrosion and erosion protection. The 2018 research awards of our department totaled \$7M. The department faculty took leadership roles in the university and college initiatives to open an Additive Manufacturing Laboratory with a focused research in metal 3D printing

and specialized training. In this newsletter, we specifically highlight the additive manufacturing research by our faculty which has grown very rapidly and will further accelerate under a recent \$10M award to UNT from the state of Texas to advance research in additive manufacturing and build industry partnerships in this important area.

With such rapid growth of our research, we are also pleased to welcome Dr. Xiao Li who joins us this fall as an Assistant Professor following her postdoc at the University of Chicago Pritzker School of Molecular Engineering. She brings expertise in polymer processing and functional materials. We continue to extend our collaborative efforts with DoD and DoE partners in additive manufacturing and energy coupled material processing, protective armor, light weight shelters and radiation protection, while also moving forward with flexible electronics, biosensors and optoelectronics. Our strong involvement with the Army Research Laboratory South Campus has spawned many collaborative projects.

This newsletter highlights several notable professional recognitions of our faculty, including a Fulbright Award to Professor Jincheng Du, the IUMRS Somiya Award to Professor Zhenhai Xia, Fellow of STLE to Professor Thomas Scharf and the Eli Whitney SME Award to Professor Narendra Dahotre. Raj Banerjee and Narendra Dahotre also were named University Regents Professors, the highest honorary rank at our university. All these recognitions stem from the energy and expertise our faculty are putting forward in growing our research and education.

On behalf of my dynamic and vibrant team of faculty, staff and students, I invite you to follow us through this department newsletter or through our website ([materials.engineering.unt.edu](http://materials.engineering.unt.edu)) to learn more on our research, education programs, and collaborative opportunities.

Andrey Voevodin  
Chair

# Facts and Figures

## 18

FULL TIME FACULTY

## 6.9

PUBLICATIONS PER FACULTY/YEAR

## \$6.7M

RESEARCH EXPENDITURES

## 21 Bachelor's

DEGREES AWARDED IN 2017-2018

## 18 Bachelor's

DEGREES AWARDED IN 2018-2019

## 13 Master's

DEGREES AWARDED IN 2017-2018

## 14 Master's

DEGREES AWARDED IN 2018-2019

## 9 Ph.D.

DEGREES AWARDED IN 2017-2018

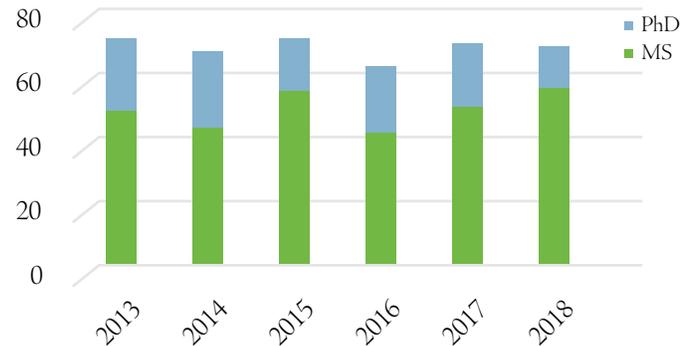
## 9 Ph.D.

DEGREES AWARDED IN 2018-2019

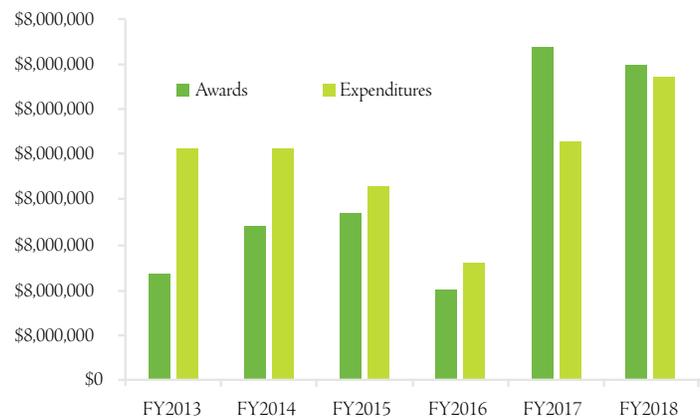
### Undergraduates Enrolled



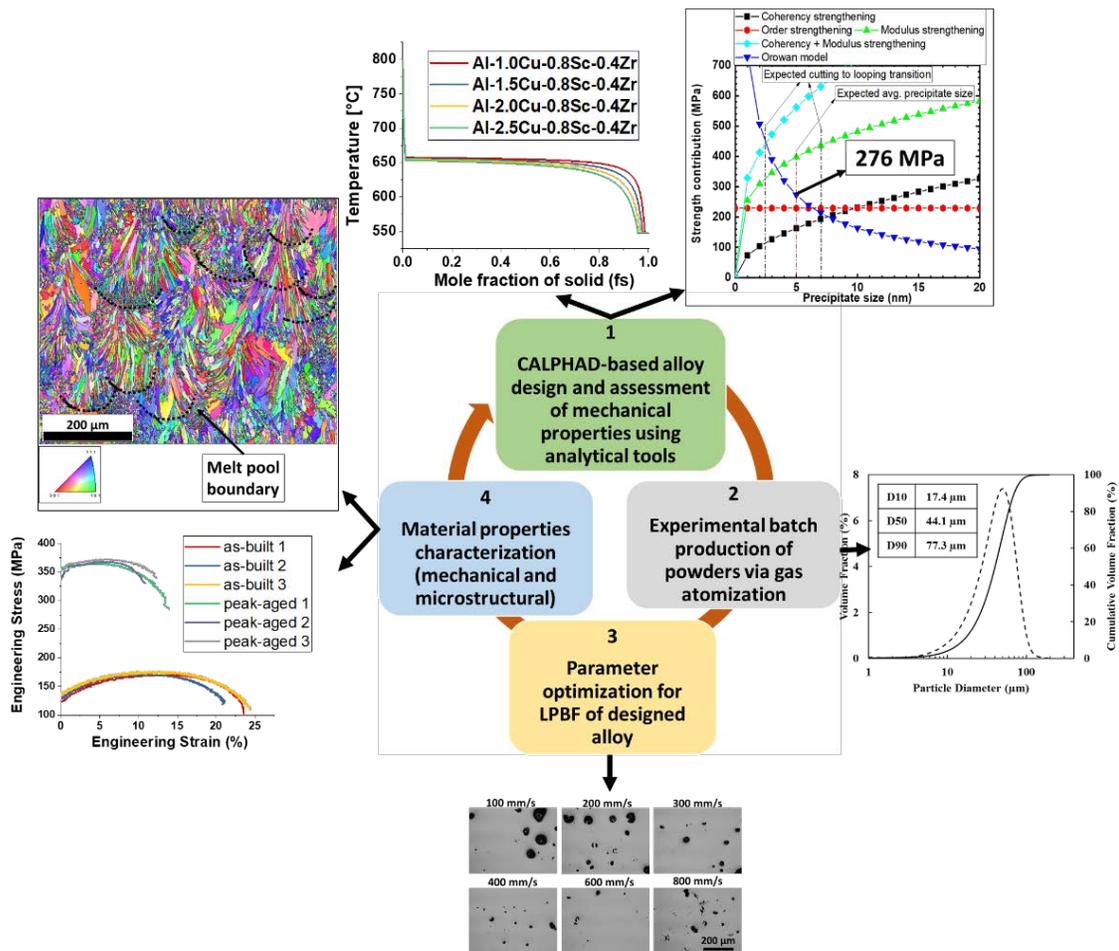
### MTSE Graduate Enrollment



### MTSE RESEARCH EXPENDITURES

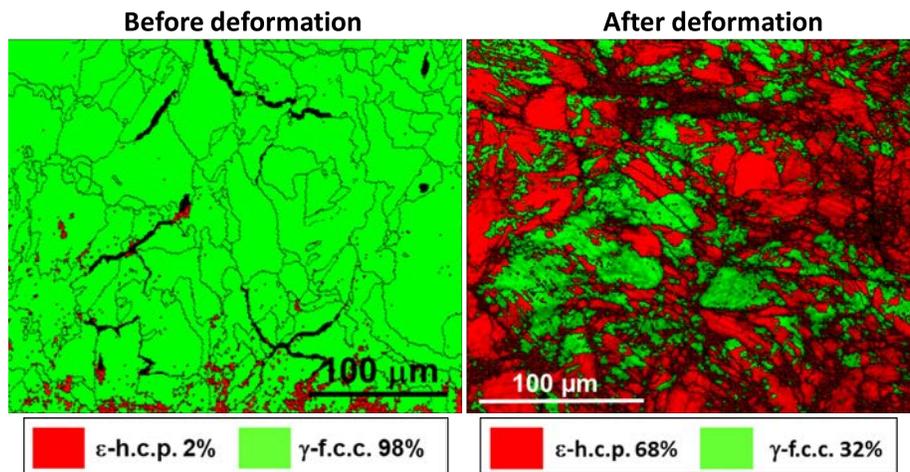


# Research Highlight: Additive Manufacturing



## ICME DESIGNED ALUMINUM ALLOYS FOR ADDITIVE MANUFACTURING

This effort establishes a closed loop methodology anchored on Integrated Computational Material Engineering (ICME) for: (a) developing new and/or modified Al-alloys for laser powder bed fusion (LPBF) additive manufacturing (AM), specifically with high strength and corrosion resistance and (b) evaluating mechanical properties of a printed component.



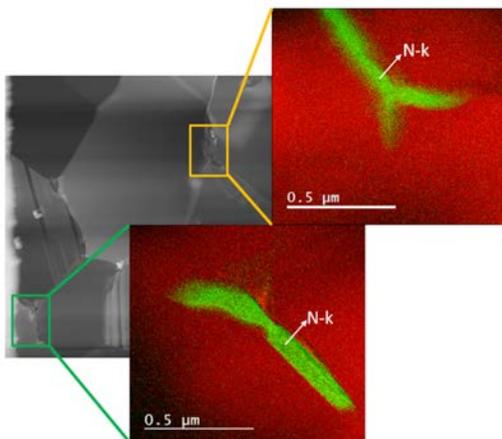
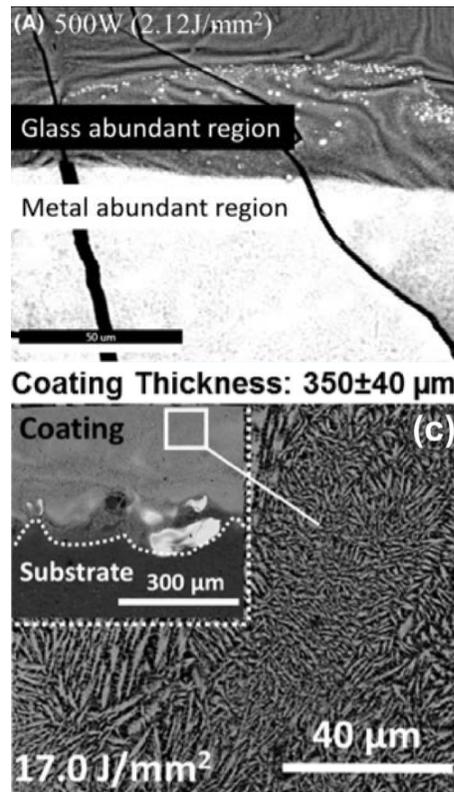
## DESIGN OF DAMAGE TOLERANT MATERIALS FOR ADDITIVE MANUFACTURING

Novel processing of metastable dual-phase high entropy alloys (HEAs) can exceed properties of stainless steel, TRIP steel and electrical steel in synergy exhibiting resistance to failure due to a localized  $\epsilon$  transformation within the crack tip plastic zone and revealing work hardening near defects. The extent of transformation is shown below in electron backscattered diffraction (EBSD) phase maps before and after a 40% compressive deformation.

### LASER-ASSISTED DEPOSITION OF CERAMICS ON METAL SUBSTRATES. (NARENDRA DAHOTRE)

Laser processing is a potential tool to synthesize  $\text{SiO}_2$ - $\text{Na}_2\text{O}$ - $\text{CaO}$ - $\text{P}_2\text{O}_5$  bioactive glass coatings on Ti-6Al-4V for bio-implant applications. Various laser processing conditions were explored to investigate their effects on coating characteristics.

Al-Co-Cr-Fe high-entropy alloy coatings were laser additively produced on an aluminum substrate. The resultant coatings consisted of a mixture of high-entropy and intermetallic phases significantly improving the surface hardness.



### IN SITU NITRIDING OF ARMOR CERAMICS VIA SPARK PLASMA SINTERING (HUNTER LIDE AND THOMAS SCHARF)

Spark plasma sintering (SPS) of B<sub>4</sub>C and B<sub>4</sub>C-TiB<sub>2</sub> ceramic composites in nitrogen atmospheres form BN intergranular films (IGF) at B<sub>4</sub>C-B<sub>4</sub>C grain and B<sub>4</sub>C-TiB<sub>2</sub> interphase boundaries to further enhance crack deflection for improved fracture toughness. The images to the right depict scanning and corresponding energy filtered TEM images of BN IGFs at different intergranular regions showing nitrogen at both B<sub>4</sub>C triple points and along B<sub>4</sub>C grain boundaries. These B<sub>4</sub>C and B<sub>4</sub>C-TiB<sub>2</sub> composites have consistent >99% theoretical density, and the formation of BN IGFs increases the fracture toughness in both B<sub>4</sub>C (5 MPa√m) and B<sub>4</sub>C-23vol.%TiB<sub>2</sub> (8 MPa√m).

## Student Awards



Kyle Rose (left), an MTSE senior was awarded the Science, Mathematics and Research for Transformation Scholarship for Service from the U.S. Department of Defense. The SMART scholarship covers full tuition and fees along with an annual stipend ranging from \$25,000 to \$38,000, health insurance, up to \$1,000 for books, a summer internship and employment with the Department of Defense upon graduation. Kyle will spend this summer at the Army Research Laboratory in Aberdeen MD and at Picatinny Arsenal in New Jersey.

Allison Osmanson (right), an MTSE MS student was awarded the First Place in the Poster Contest at the 2018 Polyolefins Conference. Her work showed that the addition of aluminum and magnesium hydroxide nanoparticles improved the thermal and mechanical properties of polypropylene.

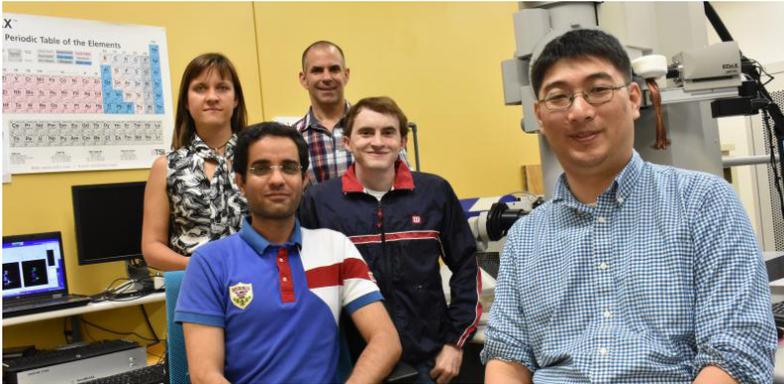


Kelly Jacques (left), an MTSE junior, recently received the Forging Industry Women's Scholarship from the Forging Industry Association. The scholarship is given to women interested in pursuing a career in the manufacturing and forging industry who have demonstrated strategic, technical and leadership skills.

MTSE graduate student, Faith Gantz, received the 2018 Finkl Scholarship from the Forging Industry Association. Gantz is part of the UNT Grad Track program where she completed her bachelor's degree while beginning her master's degree in materials science. The program allows students to complete their bachelor's and master's in five years instead of the traditional six. Gantz, who's also a mother, already has a bachelor's degree in the fine arts field.



Dr. Aditya Ayyagari, an MTSE graduate and a UNT Golden Eagle, recently made the decision to give back to the College of Engineering as a way of not only showing appreciation for the Maswood Memorial Scholarship of Engineering he received, but also to help motivate and encourage other eagles to do so, as well.



Three MTSE students were awarded scholarships from the Tribology and Lubrication Engineering Society North Texas Section for their research posters: Asghar Shirani (left) received first place and \$1,000, Jihyung Lee (right) received third place and \$500, and Tyler Torgerson (middle) received an honorable mention and \$250. Their advisors are Diana Berman (left, back) and Tom Scharf (right back)



MTSE grad student, Samantha Zellner (right) and sophomore, Neha John (left) received the most prestigious awards that UNT bestows upon student leaders—the Golden Eagle. Recipients have shown tremendous commitment to co-curricular activities and enhancing campus life at UNT by engaging in considerable service and displaying great leadership, all while achieving excellence in the classroom. MTSE graduate student, Sammy Zellner, recently won first place in the Society of Women Engineers 2018 Graduate Technical Poster Competition at the SWE Conference in Minneapolis, Minn. in October. Zellner won for her senior design project, “Design of a Corrosion Measurement System for SiC,” that she worked on with UNT students Adam Cunningham and Tyler Hunt under their advisor Professor Rick Reidy.



For ten weeks this summer, three MTSE undergraduates Kelly Jacques, Bailey Ashmore, and Alex Berendt, were College Qualified Leaders (CQL) in at the Vehicle Technology Directorate of the Army Research Laboratory in Aberdeen MD. Kelly worked on tribology of low viscosity fuels. Bailey (a scholarship UNT pole-vaulter) studied self-healing coatings on thermal barrier coatings (TBC's) for Army rotorcraft. Alex examined the behavior of molten desert sand (CMAS) on advanced ceramic TBC's for rotorcraft. With their ARL advisors (from left to right): Dr. Nikhil Murthy, Dr. Anindya Ghoshal, Alex Berendt, Kelly Jacques, Bailey Ashmore, Dr. Muthuvel Murugan, Dr. Michael Walock. Alex and Bailey were advised by Drs. Ghoshal, Murugan and Walock. Kelly was advised by Dr. Murthy and Stephen Berkebile (not pictured).



Materials Science and Engineering Department congratulates outstanding undergraduate students at UNT Honors Day (from left to right): Dr. Andrey Voevodin, Spencer Taylor (Senior), Choong Lee (Junior), Maddox Dockins (Sophomore), Dr. Marcus Young, Bryce Freeman (Freshman) not in picture. A team of College of Engineering seniors won 1st Place take first place at the CASMART (Consortium for the Advancement of Shape Memory Alloy Research and Technology) 3rd Student Design Challenge in Germany. The team was advised by Associate Professor Marcus Young, Assistant Professor Richard Zhang in the UNT Mechanical and Energy Engineering Department, and Robert Wheeler, a Research Associate in MTSE. The international engineering competition for undergrad and graduate students asked teams to create innovative technologies using shape memory alloy. created an energy efficient system for controlling solar panels on CubeSats (microsatellites) using a nickel-titanium shape memory alloy.



Professor Witold Brostow (center, our chair Andrey Voevodin and Anna Brostow (right)) retired this year after thirty years at UNT and an internationally renowned career in polymer science publishing over 300 journal articles (over 11,000 citations) with his students and colleagues from across the globe. Dr. Brostow began his academic career receiving his MS in Chemistry from the University of Warsaw in 1955 where he later received his Dr.Sc in Mathematical-Physical Sciences in 1960. In 1965, he received his second doctorate in Chemical Sciences from the Polish Academy of Sciences in 1965. Dr. (Dr.) Brostow worked at the Institute of Synthetics in Warsaw where he rose to head the division of physical chemistry. In 1969, he joined Chemistry Nobel Laureate, Paul Flory, at Stanford as a visiting scholar, and then held a similar position at in Department of Chemistry at the University of Montreal (1971-1976). He was then a professor at Mexico's Center for Research and Advanced Studies of the National Polytechnic Institute from 1977-1978. Dr. Brostow returned to the US first as a visiting professor at Ohio State in 1979, and then as an associate professor at Drexel University in 1980. In a stroke of good fortune for us, he came to the University of North Texas as a full professor in the physics department and a member of the Center for Materials Characterization in 1989. In 1996, he became one of the founding members of MTSE, and in 2000 became our department's first Regents Professor. With his excellent research record and as an amazing polyglot (speaking 6 languages), he founded the Laboratory of Advanced Polymers & Optimized Materials (LAPOM) that became the focus of international collaboration for MTSE. In 1992, he founded PolyChar-World Forum on Advanced Materials and held this international symposium at UNT until 2003 when PolyChar was hosted by scholars around the world (members from 42 countries) including Nepal, Brazil, France, and South Africa. He is President of the International Council on Materials Education and President of the Scientific Committee of the POLYCHAR World Forum on Advanced Materials. Dr. Brostow has three honorary doctorates and is a Member of the European Academy of Sciences, Member of the National Academy of Sciences of Mexico, Foreign Member of the National Academy of Engineering of Georgia in Tbilisi and Fellow of the Royal Society of Chemistry in London.

## Notable Student Publications



**Metal-Glass Composites:** Measuring wear and corrosion at micro-length scales within specific phases using scanning kelvin probe, scanning vibrating electrode technique and pico-indentation. Electrochemical and Friction Characteristics of Metallic Glass Composites at the Microstructural Length-scales, Ayyagari et al, Scientific Reports 8 (2018) 906

Advisor: Sundeep Mukherjee



**Lightweight Alloys:** Greatly Increasing the creep life of magnesium alloys with zinc additions. Exceptional increase in the creep life of magnesium rare-earth alloys due to localized bond stiffening, Choudhuri et al, Nature Communications 8 (2017) 2000 a

Advisor: Raj Banerjee



**Optoelectronics:** Development of uniform single layer WS<sub>2</sub> with tunable band gap. Synthesis of uniform single layer WS<sub>2</sub> for tunable photoluminescence, Park et al, Scientific Reports 7 (2017) 16121

Advisor: Wonbong Choi

**Lithium-Sulfur Batteries:** Development of 2D-MoS<sub>2</sub> protective layer for Li anode. 2D MoS<sub>2</sub> as an efficient protective layer for lithium metal anodes in high-performance Li-S batteries, Cha et al, Nature Nanotechnology, 13 (2018) 337-344

Advisor: Wonbong Choi



**High Entropy Alloys:** Enhancing strength and work hardenability in dual phase HEAs. Extremely high strength and work hardening ability in a metastable high entropy alloy, Nene et al, Scientific Reports 8 (2018) 9920

Advisor: Rajiv Mishra



**Nanoelectronics:** Boron Nitride as a passivation layer for 2D transistors. Hexagonal MoTe<sub>2</sub> with Amorphous BN Passivation Layer for Improved Oxidation Resistance and Endurance of 2D Field Effect Transistors, Sirota et al, Scientific Reports 8 (2018) 8668

Advisor: Andrey Voevodin



## Recent Faculty Highlights



Professor Jincheng Du recently received a Fulbright U.S. Scholar Award to research the nature of phase separations in glass materials and their biomedical applications. With this award, Dr. Du will visit the Federal University of São Carlos in Brazil, which hosts the Center for Research, Technology and Education in Vitreous Materials (CeRTEV) – a world-renowned research center on glass materials – for two two-month stints. He'll start in spring 2020.



Professor Zhenhai Xia with Professors Liming Dai (Case Western) and Jian-Feng Chen (Beijing University of Chemical Technology) received the IUMRS Somiya Award for the work “Carbon nanomaterials as metal free catalysts for renewable energy generation and storage” at the IUMRS ( International Union of Materials Research Societies) meeting in Nice France. The Somiya award recognizes an international team across at least two continents whose work is of the highest quality with a major impact on technology or society.



Professor Thomas Scharf was elected as a Fellow to the Society of Tribologists and Lubrication Engineers (STLE) for his outstanding contributions in the field of tribology. Dr. Scharf's research has focused on in materials tribology, and particularly, solid lubricants.

Rajiv Mishra, MTSE professor and director of the Advanced Materials and Manufacturing Processes Institute, was recently appointed as an associate editor of the Journal of Materials Processing Technology, an international journal in the field of processing and manufacturing of advanced materials.



Diana Berman, assistant professor of MTSE recently received the Early Career Award from the Society of Tribologists and Lubrication Engineers (STLE) Dr. Berman is studying fundamental aspects of the physical interactions of liquids in contact with 2D materials as well as on analyzing the influence of liquids on the 2D-material-underlying substrate.





MTSE welcomes Assistant Professor Xiao Li this fall. Dr. Li joins us from the University of Chicago Pritzker School of Molecular Engineering where she was a Research scientist. She received her BS degree in Polymer Materials and Engineering from the Wuhan University of Science and Technology and her PhD from the Chinese Academy of Sciences. Her research involves the patterning of block copolymers and liquid crystal polymers at the micro and nanoscales.



Raj Banerjee was named a UNT Regents Professor for his seminal contributions to research in the field of materials science and engineering at the national and international levels. Dr. Banerjee's research focus are the physical metallurgy and processing of titanium, nickel, and high entropy alloys.

Marcus Young continues collaborations with the Dallas Museum of Art (DMA) and UTD's EODIAH (The Edith O'Donnell Institute at UT Dallas) Research Center located at the DMA, where his group has had a long term relationship studying artifacts and paintings in the DMA's collection. The collaboration involves applying scientific methods to determine authenticity, identify underlying images and materials, and understand the artists and cultures who produced them.



Narendra Dahotre, interim vice president of research and innovation and a distinguished professor with the University of North Texas College of Engineering, recently received the Society of Manufacturing Engineers Eli Whitney Productivity Award for lifetime achievement in the area of manufacturing engineering. Narendra Dahotre has been named a UNT Regents Professor for his contributions to research and the university as a whole. Dr. Dahotre's research focuses are additive manufacturing and laser processing of materials.

During the 2018 and 2019 summers, MTSE Professors Rick Reidy, Jincheng Du, and Marcus Young taught MTSE introductory courses at the Dalian Jiaotong University (China). These courses are part of a continued collaboration and student exchange with DJU that began in 2017— two DJU students will begin their junior year at UNT and another begin their sophomore year here in the Fall. During his stay this summer in Dalian, Dr. Reidy also spoke to 300 Gehzi Middle School students in Dalian about the American education system and growing up in the US.



# MS and PhD Graduates

## Master of Science

### Summer and Fall 2017

Folake Ayobami Adegoke

Eforma Justin Egede

*P-type doping of pulsed laser deposited WS<sub>2</sub> with Nb*

Xinyao Lu

*Effect of HALLS and nano-ZnO worked as UV stabilizer for polypropylene*

Calvin Mikler

*Laser Additive Manufacturing of Magnetic Materials*

Christopher James Yanetta

*Additive Manufacturing of Metastable Beta Titanium Alloys*

### Spring 2018

Silvia Briseño Murguía

*Processing of NiTi Shape Memory Alloys using Hydrogen*

Gregory A. Granowski

*Recycling of PVC and XLPE for high impact resistance in spool development*

Marie-Paule Clemence Guiton

Taehwan Kim

*Preventing Thermal Degradation of PVC Insulation by Mixture of Crosslinking Agents and antioxidants*

Allison Theresa

*Osmanson Defining a Relationship Between the Flexibility of Materials and other Properties*

William Rubink

*Processing-Structure-Property Relationships of Spark Plasmas Intended Boron Carbide and Titanium Boride Ceramic Composites*

Amith Singh Thakur

Avery Wright Young

*A Study of NiTiSn Low Temperature Shape Memory Alloys and the Processing of NiTiB High Temperature Shape Memory Alloys*

### Summer and Fall 2018

Jordan Reed

*Ultrasonic Processing of Aluminum 2139 and 7050*

Tyler Torgerson

*Room and Elevated Temperature Sliding Wear Behavior of Cold Sprayed Ni-WC Composite Coatings*

Joshua Barclay

*High Temperature Water as an Etch and Clean SiO<sub>2</sub> and Si<sub>3</sub>N<sub>4</sub>*

Keirsten Gomez

*Process Improvement of Surface Preparation of Structurally Bonded*

Helicopter Detail Parts

Michael Harris

*Mechanisms of Formation and Effects of Transition Metal Oxides in Silicon Nitride on Steel Dry Sliding Contacts*

Kridapa Kulvivat

Venkata Vendra

Yineng Zhang

### Spring 2019

Bimin Cai

*The Effects of Pulsed Laser Deposition (PLD) Processing Conditions on the Surface Morphology of WS<sub>2</sub> Thin Films*

Shiridi Chappidi

Zachary Herl

Saideep Muskeri

Roberto Recuero Chen

Jibril Shittu

## Doctor of Philosophy

### Summer and Fall 2017

Venkata Aditya Ayyagari

*Surface degradation behavior in bulk metallic glasses and high entropy alloys*

Lu Deng

*Molecular dynamics simulations of the structure and properties of boron containing oxide glasses*

Bharat Gwalani

*Developing Precipitation Hardenable High Entropy Alloys*

Sameehan Shrikant Joshi

*Non-isothermal laser treatment of Fe-Si-B metallic glasses*

Srinivas Aditya Mantri

*Evolution of Precipitates and their Influence on the Mechanical Properties of  $\beta$ -Titanium Alloy*

Mumukshu Dineshkumar Patel

*Three-dimensional carbon nanostructure and molybdenum disulfide for high performance electrochemical energy storage devices*

Hao Yu

*Modeling of high strain rate compression of austenitic shape memory alloy*

### Spring 2018

Matthew A. Carl

*High-Energy X-Ray Diffraction Studies of NiTiZr and NiTiHf High Temperature Shape Memory Alloys*

Hui Che

*Surface Chemistry and Work function: Argon sputtering and nanoscale thin films covered Indium Tin Oxides*

Benjamin S. Sirota

*Investigation into Semiconducting and Device Properties of MoTe<sub>2</sub> and MoS<sub>2</sub> Ultra-thin 2D Materials*

### Summer and Fall 2018

Tso-Chang Wu

*Laser Surface Modification of AZ31B Mg Alloy Bio-Implant Material*

Chun-Yu Lin

*Design Principles For Metal-Coordinated Frameworks As Electrocatalysts For Energy Storage And Conversion*

Xiaonan Lu

*Effects of Transition Metal Oxide and Mixed-Network Former on Structure and Properties of Borosilicate Glasses*

Mengguo Ren

*Molecular Dynamics Simulations of the Structures and Properties of Aluminosilicate and Borosilicate Glasses*

Tianhao Wang

*Friction Stir Welding of Dissimilar Materials*

### Spring 2019

Barnali Mondal

*Process-Structure-Property Relationships in Friction Stir Welded Precipitation Strengthened Aluminum Alloys*

Juhong Park

*Fabrication of Large-Scale and Thickness-Modulated Two-Dimensional Transition Metal Dichalcogenides (2D TMDS) Nanolayers*

Yiyang Wa

*Bio-Inspired Material Surfaces with Self-Cleaning, Micromanipulation and Water Collection*

Kai Wang

*Substrate Nanotopography and Stiffness Modulation of Cell Behavior*

# Alumni Profiles



## Benedict (Benny) Mensah

PH.D., 2010

**Hometown:** Kumasi, Ghana

**Current position:** Senior Process Engineer - F32 Dielectrics

**Previous Positions:** Process Engineer - Dielectrics, Group Leader - Dielectrics

**Previous Schools:** Kwame Nkrumah Univ of Science and Technology - Kumasi, Ghana, Texas State Univ.

**How did your time at UNT help you with your career:** My time at UNT shaped me to face most of the challenges squarely and always believe in myself that I can be successful. Through my training at UNT, I was able to quickly understand how the semiconductor industry works. My research on Thin film deposition and characterization under Professor Scharf helped me demonstrate my technical strength in the Dielectrics team. My participation in extra-curricular activities such as volunteering on campus also helped me identify areas that I could help other people here at Intel.

**Interesting Experiences (work or school):** Working at Intel in several roles for the past 7.5 years has been very exciting. I have met a lot of smart and dedicated people that together we all solve complex problems on a day to day basis. I have also come across people with different backgrounds whether culturally or technically that bring their expertise to bear when solving problems.

My time at Intel Manufacturing has been very challenging and rewarding at the same time. I have personally solved complex equipment and process problems as part of my role as an Engineer. I have also had the unique opportunity to train and mentor some of the junior Engineers. During my time as a group leader, I managed a group of Dielectrics Engineers and Technicians and under my direction, the team worked through some technical challenges which helped improve the Department's and Factory's metrics. The most exciting experiences in my time at the company is the satisfaction I get every day that I'm part of a group that is solving most of the world's major Semiconductor challenges and the fact that I work on the newest technologies makes it more rewarding. I am proud to say that I have and continue to help bring comfort to people in need through our products and we have helped shape a better place in this world for Humanity. Anything else you would like to mention about your career path and experiences: Believe in yourself and follow your passion.



## Kiersten Gomez

B.S., 2016, M.S., 2013

**Hometown:** Amarillo, Texas

**Current position:** Bell Helicopter, Chemical and Process Lab- Engineer I

**Previous position:** Bell Helicopter, Chemical and Process Lab Co-Op

**Previous School:** UNT was the only school I attended

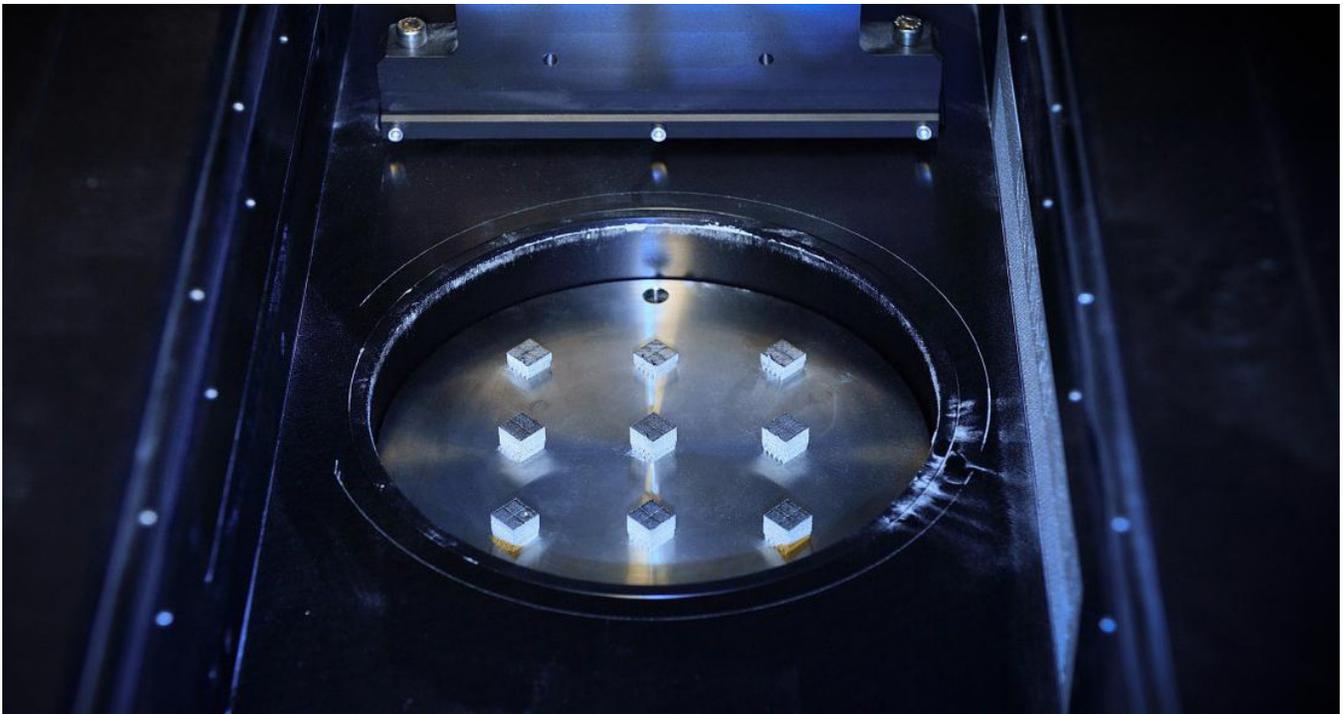
**How did your time at UNT help you in your career:** My time at UNT in the MTSE department allowed me to further my knowledge of what was possible for me career wise. Also, I was able to work with not only my peers but the professors as well which has helped me learn how to work with not only coworkers but upper management and how to build professional relationships with them as well. Dr. Marcus Young allowed me to begin research in his lab my Junior year which allowed me to receive a co-op position at Bell Helicopter. From there, he continued to guide me in career and academics. I was able to secure a job at Bell Helicopter during my first semester of my senior year. I believe the experiences and opportunities I had during my time in the MTSE department prepared me to excel at my current job.

**Interesting Experience:** One thing I have learned while being in the Chemical and Processes Lab is, although it may not be directly related to my undergrad studies there is still information and knowledge I can bring to the table. Working in a position that I do not have a large background in has allowed me to expand my capabilities and see how MTSE effects other material in different ways.

Also, during my time here at Bell I have begun working on a cross-functional project that allows me to work with peers from all over the company. From this, I have been selected to represent Bell on recruiting material and I have brought flight and product experiences to employees. All this to say, don't be afraid to get involved with your community at your job, you do spend most of your days there.

## Additive Manufacturing Laboratory

UNT's new state-of-art Additive Manufacturing Laboratory located within the university's centralized Materials Research Facility, officially opened in November 2018 helping to pave the way to this new future of manufacturing (Dean Yan Huang, VP Research and MTSE professor Narendra Dahotre, and President Neal Smatresk). AML houses two additive manufacturing tools: the Aconity Midi Selective Laser Melting System and the Optomec LENS 750 System. With several faculty, this facility comprises UNT's Center for Agile and Adaptive Additive Manufacturing (CAAAM), dedicated to developing market-based solutions for Texas industries.



In May 2019, the 86th Texas Legislature awarded CAAAM \$10 million to establish a Texas-based prototype center that could “globally transform the future of advanced manufacturing.” The center will primarily be used to conduct research in the field of smart materials and environmentally friendly technologies for a range of industries including healthcare and oil and gas. In doing so, the center will also create a highly skilled workforce of engineers within Texas that can benefit the state’s industries.



DEPARTMENT OF MATERIALS  
SCIENCE & ENGINEERING  
College of Engineering

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