

MATERIALS SCIENCE AND ENGINEERING (MS&E) SEMINAR SERIES
Friday November 12, 2021 at 3:00 pm via Zoom

<https://wvu.zoom.us/j/96511600696?pwd=Q2lwNUxuanlMNIA5TFNqU0YrcUlpQT09>

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Is necessity the mother of invention? The story behind the invention of Forcespinning®

Dr. Karen Lozano, UTRGV Professor of Mechanical Engineering and Founder/Director of the UTRGV Nanotechnology Center

ABSTRACT: In this presentation we will learn about Forcespinning® and its potential applications ranging from smart clothing to wound healing to aerospace applications. Forcespinning® is a method that can produce hundreds of meters of nanofibers (NFs) per minute. Several years ago, it caused a disruption in the NF scientific community and quickly gained the attention of technology scouts and CTOs from all over the world. NFs have unique properties such as small diameter, high specific surface area, and high aspect ratio. NF architectures (individual NFs, nonwoven mats, yarns, and woven mats) are suitable for a variety of applications in markets with a combined value of over \$20B dollars, for example, in the biomedical field, NFs are making an impact on high-performance filter media, artificial blood vessels, biochips, nanosensors, and soft tissue/organ repair & regeneration. For decades, NFs were merely a scientific curiosity given that available production methods could not satisfy commercial requirements. In 2009, Lozano and her team introduced ForceSpinning® as a potential industrial alternative. This process is based on a centrifugal force-mediated transformation of a polymer solution or melt into fine fibers in the absence of electric fields, in lay terms, similar to a process commonly used to make COTTON CANDY!

Bio: Dr. Karen Lozano, UTRGV Professor of Mechanical Engineering and Founder/Director of the UTRGV Nanotechnology Center, received her BS in Mechanical Engineering from Universidad de Monterrey and MS/PhD from Rice U. Since 2000, Lozano has supported a far-reaching transformation at a non-PhD teaching institution through solid innovative/leadership skills. She has focused her energy in promoting an institutional and societal transformation by creatively combining undergraduate (UG) education with state-of-the-art research projects. Her efforts have led to 100% retention and graduation rate of UG research assistants in a community where high school and college graduation rates have been historically low. She has provided research opportunities to hundreds of students, all now leading successful careers in industry, academia, or government labs. She is the recipient of several honors/awards such as the 2019 US Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM), National Academy of Inventors (NAI) Fellow, TEDx Speaker, and Engineer of the Year by Great Minds in STEM. Lozano's team has published >150 peer reviewed scientific journal articles and >350 proceedings/conference presentations. She is a prolific inventor and co-founded a successful company which received several awards such as the R&D 100. She outreaches to thousands of K-16 students through summer camps, magic/science shows, and social media, all with one goal in mind: preparing future innovators.



MS&E Seminar Series is sponsored by the Department of Chemical Engineering, Lane Department of Computer Science and Electrical Engineering, and Department of Mechanical & Aerospace Engineering.

OFFICE OF MECHANICAL AND AEROSPACE ENGINEERING

1306 Evansdale Drive | PO Box 6106

Morgantown, WV 26506-6106

☎ 304.293.3111 📠 304.293.6689

mae.statler.wvu.edu

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