



Letter from the Interim Director



Daan Liang, Ph.D., P.E., Interim Director, NWI.

It's a time of turbulence and uncertainty in higher education. The outlook for federal research funding is in flux, and state support could drop drastically. Within the university, key administrative positions – the Provost and the Vice President for Research – are yet to be filled, in addition to the Director of our own institute.

These developments raise a series of questions. What are the opportunities that we should target? Do we have the resources to maintain (or even elevate) our competitive advantage? How will the balance be shifted between government-sponsored and industry-sponsored research activities?

Against the backdrop of the statewide hiring freeze and possible cuts in support and funding, our faculty affiliates continue to achieve higher levels of excellence at an amazing pace. They are not only eminent researchers, teachers, and inventors, but are also thought leaders who influence local and national policies.

This can be best demonstrated by the appointment of Dr. **Kishor Mehta** to the National Advisory Committee on Windstorm Impact Reduction (NACWIR) under the United States Department of Commerce National Institute of Standards and Technology. In 2016, Texas Tech nominated Kishor to the committee, and after nearly three months of extensive review, the official letter of appointment arrived this month. (It should be noted that the initial framework of the National Windstorm Impact Reduction Program was first conceived by a small group of

wind engineering researchers (including Kishor) more than 20 years ago before being enacted into the law by the Congress in 2004.) In this advisory role, Kishor will continue his lifetime commitment to protecting lives and properties from severe windstorms through research, education, and mitigation.

More exciting news is that Dr. **Miao He**, an Assistant Professor in the Department of Electrical and Computer Engineering, has been selected to receive an award from the NSF's Faculty Early Career Development (CAREER) Program. The program offers the NSF's most prestigious awards in support of early-career faculty who have the potential to serve as academic role models in research and education, and to lead advances in the mission of their department.

The \$500,000 award will allow Miao to seek fundamental breakthroughs in wind power ramp risk assessment and curtailment reduction to enable efficient utilization of increased wind power capacity in bulk power systems. Miao has been an important member of the Global Laboratory for Energy Asset Management and Manufacturing (GLEAMM) team and, in 2016, received a seed grant from NWI titled "Weather Front-Induced Wind Farm Power Ramps: Probabilistic Modeling, Risk Assessment and Online Operation Tools". Miao's name is now added to a growing list of NWI faculty affiliates who have been conferred this esteemed NSF award including Drs. **Ali Nejat** (2015), **Eric Bruning** (2014), **Changzhi Li** (2012), **Brian Ancell** (2012), and **John Schroeder** (2002).

Also this month, Dr. **Xinzhong Chen**, a Professor in the Department of Civil, Environmental, and Construction Engineering, has been selected as the 2017 recipient of Jack E. Cermak Medal by the Structural Engineering Institute and the Engineering Mechanics Institute under the American Society of Civil Engineers (ASCE). The medal honors Xinzhong's work in advancing wind engineering through advanced modeling and analysis approaches for wind load effects on structures, such as high-rise buildings, long-span bridges and wind turbines. He will receive the award on April 7 at the Structural Congress Conference in Denver.

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NWI INTERIM DIRECTOR'S LETTER *continued*

Initiated in 2002 to recognize Dr. Jack E. Cermak's lifetime achievements in the field of wind engineering and industrial aerodynamics, the medal has been bestowed to a total of 13 individuals, and Texas Tech University is the only institution with two or more winners (**Kishor Mehta** won it in 2014), and reflects our long-standing prominence in wind engineering research.

It is now even more important to leverage our collective wisdom and organizational strength to overcome the challenges and to capture future opportunities.

Go Raiders!

Daan Liang, Interim Director

MCDONALD-MEHTA LECTURE SERIES: DR. ELLEN RATHJE

The first Spring 2017 lecture of NWI's prestigious McDonald-Mehta Lecture Series occurred with our invited presenter, Dr. Ellen M. Rathje, the Warren S. Bellows Centennial Professor in the Civil, Architectural and Environmental Engineering Department at the University of Texas (UT) at Austin, and Senior Research Scientist at the UT Bureau of Economic Geology.

Titled "DesignSafe Cyberinfrastructure: A Cloud-Based Environmental for Research in National Hazard Engineering," Dr. Rathje's presentation was well attended and well received.

Dr. Rathje is a founding member and current Co-Chair of the Geotechnical Extreme Event Reconnaissance (GEER) Association, and she is the Principal Investigator for the DesignSafe-ci.org cyberinfrastructure for the NSF-funded Natural Hazards Engineering Research Infrastructure (NHERI), and co-PI for the Center for Integrated Seismicity Research (CISR) at the Bureau of Economic Geology.

Dr. Rathje was named a Fellow of the American Society of Civil Engineers in 2016.

The McDonald-Mehta Lecture Series is named after and funded with the endowment of Dr. **Kishor C. Mehta** and Dr. **James McDonald**, founding faculty members of the former Wind Science and Engineering Research Center (WiSE) now the National Wind Institute (NWI). The lecture series invites nationally-known scientists and experts in wind-related industries to campus for presentations in their area of academic excellence.



(Above L-R) - NWI co-founder, Dr. Kishor Mehta stands next to Dr. Ellen Rathje (UT-Austin) who was the first speaker for the McDonald-Mehta Lecture Series this Spring.

The next McDonald-Mehta Lecture Series event will be with Dr. Sanjay Arwade from the University of Massachusetts at Amherst. Presentation title: "Extreme Events and the Reliability of Offshore Wind Energy Structures." The event will be at 3:30 p.m. on Wednesday, April 19 in Experimental Sciences room 120.

NWI FACULTY AFFILIATE MIAO HE AWARDED NSF CAREER AWARD

Text Credit: George Watson, TTU Marketing and Communications

Miao He's work with enhancing the efficiency of wind turbine farms in the face of disruptive weather has earned him a prestigious grant from the National Science Foundation (NSF) that recognizes the work of up-and-coming faculty.

He, an Assistant Professor in the Department of Electrical and Computer Engineering in the Texas Tech University Whitacre College of Engineering, has been selected to receive an award from the Faculty Early Career Development (CAREER) Program.

The program offers the NSF's most prestigious awards in support of early-career faculty who have the potential to serve as academic role models in research and education, and to lead advances in the mission of their department. Their work indicates the beginning of a lifetime of leadership in integrating education and research.

He is a member of the Texas Tech Global Laboratory for Energy Asset Management and Manufacturing (GLEAMM) team, a collaboration of innovators, industry leaders and for-profit testing, certification and manufacturing facilities focused on protecting, enhancing, and managing energy transmission and distribution on the electric grid.

"This award will support me in conducting cutting-edge research in the integration of stochastic wind energy sources into bulk power grids and power system operations." He said, "The outcomes of the project will contribute to fulfilling the important milestones and research goals of the GLEAMM project. This research project will train and prepare graduate students to be qualified engineers and researchers for a secure and sustainable energy industry in the future. I want to specifically acknowledge the support of the National Wind Institute 2016 Discovery Program, as well as the collaborations from GLEAMM researchers."

He, who earned his doctorate in 2016 from Arizona State University, received a \$500,000 grant from the CAREER program for his research, "Risk-Aware Power System Operations with Significant Wind Power Penetration."

His study will examine ways large wind turbine farms can effectively handle occurrences where the speed and direction of wind around those farms changes quickly and dramatically, also known as "wind ramps", in order to improve efficiency of the wind farms. It will also produce an early alarm system for large wind power ramps due to extreme weather events as well as cost-effective operational protocols for acquiring power reserves to compensate for any loss of efficiency due to wind ramps.

"For those who live in West Texas, it does not take long to appreciate that we enjoy limitless wind," said Dr. Guy Loneragan, Interim Vice-President of Research at Texas Tech. "At TTU, we are advancing ways to harness the power of wind and deliver renewable energy. This is good for all of us. Miao He seeks to meaningfully improve energy generation, management and distribution, and we are thrilled that he has received a CAREER award from the National Science Foundation to advance integrated research and education."

In 2015, He received two large grants totaling \$618,000 to help further this research. He received more than \$318,000 from the Electric Reliability Council of Texas (ERCOT), and almost \$300,000 from the NSF to help develop data analytic tools to measure sensory data from wind farms. The research focuses in developing algorithms and software tools to detect wind ramp events as well as extracting real-time data information to help wind farm operators determine how much to increase or decrease power output from wind turbines depending on the disruptiveness of the wind ramp event.

"This work is critically needed by our nation and state to manage the challenges—and opportunities— of wind energy," Loneragan said. "This fantastic achievement elevates Dr. He and also raises the reputation of Texas Tech University as a great public research university."

For more information, [please check here](#).



Dr. Miao He, Associate Professor, who received an NSF CAREER award.

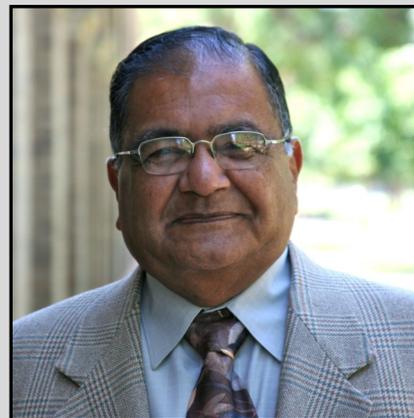
NWI CO-FOUNDER APPOINTED TO NIST COMMITTEE

Dr. **Kishor Mehta** (pictured right), former Director of WiSE (now NWI) and Horn Professor, has been appointed as a member of the National Advisory Committee on Windstorm Impact Reduction (NACWIR). The term begins immediately and will last until September 30, 2017.

The committee advises the Director of the National Institute of Standards and Technology (NIST) under the U. S. Department of Commerce.

The statutory responsibilities of the NACWIR include assessing trends and progress in the sciences and practices related to windstorm impact mitigation, implementing the priorities of the Strategic Plan for the National Windstorm Impact Reduction Program, assessing the program's impact and then making revisions as necessary.

Congratulations, Dr. Mehta. (For more information, [please check here.](#))



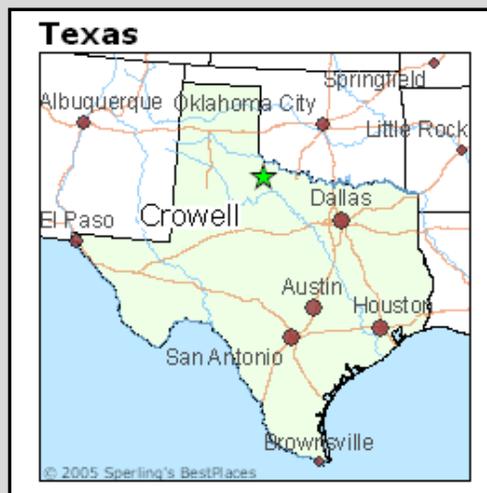
WEST TEXAS MESONET EXPANDS ACROSS THE STATE

NWI is proud to announce that the burgeoning West Texas Mesonet network has now added station #103 in Crowell, Texas.

The Crowell station is located in central Foard County and is one mile east of Crowell (or 40 miles southeast of Childress).

Special thanks from NWI and the West Texas Mesonet to Crowell State Bank and the National Weather Service team in both Lubbock and Norman, OK, for their help in building this new addition.

The West Texas Mesonet network is managed by Wes Burgett and consists of 103 stations in 69 counties, three states, and two different time zones.



'TIS TORNADO AWARENESS SEASON...



The Spring months in West Texas mean high winds and the beginning of the dangerous tornado season.

To bring a heightened level of awareness to viewers across the Lone Star State, TV stations have been sending camera crews and reporters to interview Research Assistant Professor Larry Tanner and to see the debris impact cannon deliver its powerful safety message.

Crews from both Abilene's KTAB and Fort Worth's KXAS recently visited the DIF lab to get some footage and an interview with Larry.

(Left) - Research Assistant Professor Larry Tanner gets interviewed on camera by the visiting KXAS crew.

ASCE STANDARDS COMMITTEE FOR TORNADO WIND SPEED ESTIMATION MEETS IN OKLAHOMA

Text by Dr. Arn Womble, WTAMU

The Main Committee of the ASCE Tornado Wind Speed Estimation Standard Committee held their most recent meeting at the National Weather Center in Norman, Oklahoma, on February 15-17 in conjunction with the National Tornado Summit. TTU’s National Wind Institute was well represented by the large number of faculty affiliates and alumni who were on the various committees.

The forthcoming document represents a 5+ year joint effort of the ASCE and the National Weather Service to forge standards for use in the estimation of tornado wind speeds using a variety of methods including the revised/expanded Enhanced Fujita (EF) Scale, tree fall patterns, forensic analysis of damage, radar measurements, *in situ* measurements, remote sensing of damage, and data archiving. The estimated completion date for the first version of the standard is 2019.

Members of the committee includes the following who all have links with TTU-NWI:

Chair - EF Scale Subcommittee	Tanya	Brown-Giammanco	IBHS
Associate Member	Richard	Krupar III	Post Doc, University of Queensland,
Co-Chair - Main Committee	Marc	Levitan	NIST
Member - Main Committee	Daan	Liang	Texas Tech University/NWI
Chair - <i>In Situ</i> Measurements Subcommittee	Frank	Lombardo	University of Illinois
Main Committee	Tim	Marshall	Haag Engineering
Associate Member	Maribel	Martinez	DOE CNS Pantex Emergency Management
Associate Member	Kishor	Mehta	Texas Tech University/NSF
Associate Member	Matt	Phelps	APEC, LLC
Associate Member	Pataya	Scott	NIST, FEMA
Associate Member	Patrick	Skinner	NOAA/NSSL
Chair—Remote Sensing Subcommittee	Arn	Womble	West Texas A&M University
Associate Member	DeLong	Zuo	Texas Tech University/NWI



Photo Courtesy: Jim LaDue.

NWI GRANTS AND CONTRACTS — FEBRUARY 2017

Awarded:

GLEAMM: NWI: CAREER: Risk-Aware Power System Operations with Significant Wind Power Penetration
National Science Foundation (NSF)

M. He (Electrical and Computer Engineering)

100%

\$500,000

NWI FACULTY AFFILIATE FEATURED IN UK'S *THE GUARDIAN* NEWSPAPER

NWI's Professor of Practice, Dr. **Carsten Westergaard** (pictured right), was recently cited as an academic expert in an [article in the UK's The Guardian newspaper](#) on the trends of wind energy in the West Texas region.

According to its on-line site, The Guardian has a daily print circulation of roughly 162,000 copies in the UK, with close to 42.5 million readers for its on-line edition. Its combined print and online editions reach nearly 9 million British readers.

Dr. Westergaard is very accomplished in the area of wind energy, and is heavily involved with a number of wind-related research projects linked with the NWI.

NWI is proud of our faculty affiliates who work so closely with the international media. Thank you.



NWI INSTRUCTORS ATTEND CAMPUS ADVISING CONFERENCE



(Above) - Matt Saldana, Instructor in the BSWE program, at the conference.

TTU's Teaching, Learning and Professional Development Center recently hosted a conference focused on advising and student development in general.

NWI was well represented there with Associate Director of Education, Dr. **Andy Swift**, and **Marina Gonzales**, who works with our 2+2 partner, West Texas Community College in Snyder.

Titled, "Using Transparent Assignments to Increase Students' Success Equitably," the conference was focused towards advisors.

ASCE 7 SEMINAR OFFERED FOR GRADUATE STUDENTS

Structural engineering graduate students recently attended a special seminar on the wind load provisions of ASCE-7, a event offered to familiarize graduating TTU students with the background and details of this document.

Offered by Drs. **Kishor Mehta**, **Delong Zuo**, **Stephen Morse**, **Xinzhong Chen**, and **Daan Liang**, 20 students participated in the multi-evening 10-hour course which was held in February.



(Above) - Dr. Kishor Mehta, Horn Professor and NWI co-founder, teaches graduate students about the ASCE wind load provision.

XINZHONG CHEN AWARDED JACK E. CERMAK MEDAL FOR WORK IN WIND RESEARCH



(Above) - Dr. Xinzhong Chen, Professor in CECE and recipient of the ASCE Jack E. Cermak Award.

NWI faculty affiliate Dr. **Xinzhong Chen**, a Professor in the Department of Civil, Environmental, and Construction Engineering here at TTU, has been awarded the Jack E. Cermak Medal for his analytic and statistical approach towards researching wind-related issues.

The award is presented by the Structural Engineering Institute and the Engineering Mechanics Institute under the umbrella of the American Society of Civil Engineers (ASCE). He is the second Texas Tech NWI researcher to have earned this medal, joining Dr. Kishor Mehta, NWI co-founder, who was honored in 2014.

“I am very pleased, honored, and humbled to receive this prestigious recognition,” Chen said. “I am also proud to mention that Texas Tech is the only school with two winners of this award. This recognition speaks well of our wind engineering program and will have great positive impact on my research program here at TTU.”

The medal was established to recognize the lifetime achievements of Jack E. Cermak, an expert in the field of wind engineering and industrial aerodynamics. It is awarded to researchers who have made numerous distinguished contributions in wind engineering and is considered one of the highest recognitions in the field.

Chen is considered one of the leading authorities in bridge and building aerodynamics and will receive the medal in April at the Structural Congress 2017. He has been on the faculty at TTU since 2004.

JAPANESE VISITORS MEET WITH NWI FACULTY AFFILIATES

NWI faculty affiliates Drs. **Darry James** and **Delong Zuo**, recently met with visitors from Japan to further discuss their research project titled “Velocity of Electric Power Industry, Japan”.

Drs. Yuzuru Eguchi and Keisuke Nakao, both from the Central Research Institute of Electric Power Industry, met with project PIs, Dr. James and Dr. Zuo, along with Dr. **Zhou Tang**, an NWI Post-Doctoral Research Associate to discuss outcomes of the mutual research project.

Additionally, the visitors also watched a demonstration of VorTECH, NWI’s tornado simulator which is involved with experiments linked with this project.



(Right) - A photograph shows the VorTECH in action.

NWI CO-HOST SUCCESSFUL *REWARDED WITH WIND* EDUCATIONAL WORKSHOP



(Above) - The workshop panel (L-R) - David Foster, Dr. Bradley Ewing and Ms. Susan Sloan (AWEA). Workshop moderator Dr. Carsten Westergaard, Professor of Practice with NWI, stands at the podium.

The National Wind Institute (NWI) recently co-hosted a successful wind energy community workshop. Partnering with the non-profit group, Wind Foundation, the *Rewarded with Wind* event focused on reaching both the campus and the off-campus communities to spread the word of the benefits of wind energy in the West Texas region.

The speaker list was prestigious and diverse, and included Dr. **Bradley Ewing**, C. T. McLaughlin Chair of Free Enterprise in TTU's Energy Commerce program, Ms. Susan Sloan, Vice-President of State Policy for the American Wind Energy Association (AWEA), and Mr. David Foster, the Texas Director of Clean Water Action, a non-profit organization that focuses on environmental and community issues across the state.

NWI representatives included NWI Associate Director of Education, Dr. **Andy Swift**, NWI Associate Managing Director Dr. **Anna Young**, and NWI Professor of Practice Dr. **Carsten Westergaard**.

"The National Wind Institute is so proud to be a partner on this important outreach effort, engaging and communicating with our local communities about wind energy impacts and policies," Dr. **Daan Liang**, NWI Interim Director. "It reflects our commitment to serving the public through research and education."

The workshop was well attended and ran smoothly, thanks to Dr. Young and the staff at NWI and the Wind Foundation organization. Special thanks to Mayor Dan Pope and other Congressional counterparts for attending this event.



(Above) - The lecture room was packed with a large audience from on- and off-campus.

NWI FACULTY AFFILIATES RECOGNIZED FOR EXCELLENCE

NWI is proud to have such high achieving faculty affiliates, including the following:

- Dr. **Ali Nejat** (Civil, Environmental and Construction Engineering) promoted from Assistant Professor to Associate Professor
- Dr. **Yong Chen** (Computer Science) promoted from Assistant Professor to Associate Professor
- Dr. **Brian Ancell** (Geosciences/ATMO) has been awarded faculty development leave



Dr. Ali Nejat, Associate Professor (CECE)

RECENT PUBLICATIONS and PROCEEDINGS (as reported by Web of Science)

Giammanco, I. M., **J. L. Schroeder**, F. J. Masters, P. J. Vickery, R. J. Krupar, III, and J.-A. Balderrama (2016). "Influences on Observed Near-Surface Gust Factors in Landfalling US Gulf Coast Hurricanes: 2004-08." *Journal of Applied Meteorology and Climatology* 55(12): 2587-2611. 10.1175/JAMC-D-16-0053. December.

Mathur, R. R., J. A. Rice, **A. Swift**, and J. Chapman (2017). "Economic Analysis of Lidar-Based Proactively Controlled Wind Turbines." *Renewable Energy* 103: 156-170. 10.1016/j.renene.2016.10.069 April.

Qi, X., D. Ye, Y. Sun, **C. Li**, and L. Ran (2017). "Simulations to True Animals' Long-Distance Geomagnetic Navigation." *IEEE Transactions on Magnetics* 53(1). 10.1109/TMAG.2016.2600540. January.

Ramabhotla, S., S. Bayne, T. Flack, and **M. Giesselmann** (2017). "Reliability Optimization in the Islanded Mode of Microgrid." *Journal of Energy and Power Engineering* 11(2): 103-114.

Ray, W. B., II, M. Kim, **A. Bilbao**, J. A. Schrock, and **S. B. Bayne** (2016). "Analysis on Repetitive Pulsed Overcurrent Operation of GaN Power Transistors." Fayetteville, AR: 2016 IEEE 4th Workshop on Wide Bandgap Power Devices and Applications (WIPDA). November 7-9. 353-356.

Ren, B., Y. Wang, and Q.-C. Zhong (2017). "UDE-Based Control of Variable-Speed Wind Turbine Systems." *International Journal of Control* 90(1): 121-136. 10.1080/00207179.2015.1126678.

Tang, Y., Z. Peng, L. Ran, and **C. Li** (2016). "iPrevent: A Novel Wearable Radio Frequency Range Detector for Fall Prevention." Fayetteville, AR: 2016 IEEE International Symposium on Radio-Frequency Integration Technology (RFIT). November 7-9.

Womble, J. A., R. L. Wood, **D. A. Smith**, **E. I. Loudon**, M. E. Mohammadi, and K. R. Leitch (2016). "Reality Capture for Tornado Damage to Structures." *The Structural Engineer*. Summer 2016.

Zuo, D., L. Wu, **D. A. Smith**, and **S. M. Morse** (2017) "Experimental and Analytical Study of Galloping of a Slender Tower." *Engineering Structures* 132: 44-60. 10.1016/j.engstruct.2016.11.027. February 01.

If you are interested in having your latest scholarly endeavors featured in the next NWI newsletter, please forward your information (publications, proceedings, conference/workshop attendance, or other news etc.) to Liz Inskip-Paulk (email: Elizabeth.paulk@ttu.edu).