



TEXAS TECH UNIVERSITY National Wind Institute™

January 2016—Issue 78

Dear NWI affiliates and friends:

At the start of a new year and a new semester, I would like to take this opportunity to express my appreciation of your support to the institute and your contribution to our success.

We continue making great strides towards the goals outlined in the Five Year Strategic Plan. 2016 is poised to be a great year for the wind energy industry, as a multi-year extension of the wind energy Production Tax Credit (PTC) and Investment Tax Credit (ITC) has been passed, giving companies a level of predictability needed to add new wind projects to the electrical grids. The extension will help create a steady, strong demand for the graduates of our wind energy programs, at both the bachelor and doctoral levels. In addition, we anticipate receiving more industry-sponsored research projects aimed at driving down costs and improving wind energy's competitiveness.

NWI is well-positioned to pursue funding opportunities from the DOE's grid modernization program. Interestingly, the DOE's awareness of, and emphasis on grid system's resiliency to natural disasters such as severe storms, creates an opportunity for our existing strengths in wind engineering, severe storm, weather forecasting, power electronics, and grid modeling to be leveraged, and our expertise in wind energy and wind hazard combined.

FY2015 was another year of success for NWI, as measured by sponsored research. We were credited for generating ~\$880,000 in overhead returns, more than 10% of the total amount by the university. 38 NWI affiliates contributed to various diverse projects funded NSF, DOE, NOAA, DOD, DARPA, Google, and others.

To better support our affiliates, I have requested our administrative staff focus on the following four priorities in 2016, including

- Improve customer service provided to researchers;
- Increase work productivity and efficiency;
- Develop and implement focused communication strategies;
- Streamline record keeping.

For the second year, NWI is organizing an internal competition to support innovative, early-stage, and entrepreneurial concepts proposed by the Institute's faculty affiliates. Last week, we announced FY2016 awards to three researchers - Brian Ancell (Geosciences), Miao He (Electrical and Computer Engineering), and Delong Zuo (Civil, Environmental, and Constructing Engineering) - to fund their work in weather forecasting, wind farm modeling, and wind load simulation. Award recipients were selected based on proposal intellectual merit, alignment to four program priorities, and the PI's prior research productivity. In addition, we have made a financial commitments in the form of cost matching to two proposals submitted to NOAA and NSF. In response to the feedback from our External Advisory Board, we are soliciting input from our researchers on critical safety, security, and usability improvements to our laboratories and facilities at Reese Technology Center. NWI will be supplementing our own funds through investment from other stakeholders. These investments are necessary to complete our proposed improvements in phases.

In the meantime, NWI is facing many challenges, some short-term and others long-term. As an organization, we continue to operate as a research center and therefore, lack the level of predictability in funding enjoyed by academic departments. The reality, however, is that we have expansive responsibilities in running multiple education programs (BS, PhD, and Graduate Certificates), maintaining state-of-the-art facilities (laboratories and field site), delivering public and commercial services (West Texas Mesonet, Mobile Radars, Debris Impact), and supporting a diverse group of researchers. How we can meet current needs while investing in future growth can be a difficult question to answer without a more sustainable financial model in place. As the interim director, I have been working diligently with the Office of the Vice President for Research on seeking a highly qualified, and motivated person to fill that position as quick as possible.

In closing, I congratulate all of you for your success in 2015 and thank you for placing NWI on such a solid foundation. It is my belief that working together, we can propel NWI to a higher level of excellence and a national model for interdisciplinary research and education.

Daan Liang
Interim Director, NWI

NWI faculty affiliate Brian Ancell awarded Chancellor's Council Teaching and Research Award



(Above) - Dr. Brian Ancell, Assistant Professor in ATMO and NWI faculty affiliate.

Dr. Brian Ancell, NWI faculty affiliate and Assistant Professor in Atmospheric Sciences, has been awarded the Chancellor's Council Distinguished Research Award to recognize him as one of the top teaching and research faculty in the Texas Tech University System. The Chancellor's Council has recognized excellent teaching and research faculty since 2001 when the award was first introduced.

According to Texas Tech University, the Chancellor's Council recognizes the important contributions outstanding faculty members make to the university and health sciences center communities and to each of their students' lives.

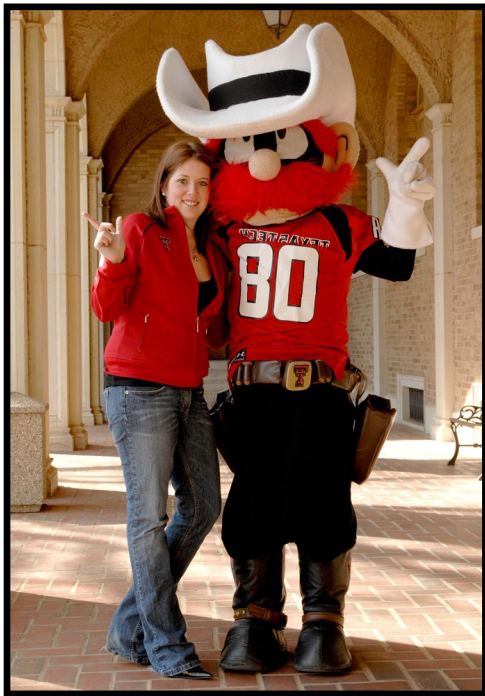
Robert Duncan, the Texas Tech System Chancellor continues: "Your efforts are among the many reasons our students receive an outstanding education. I am greatly impressed with the impact you have made on our students and in your individual field."

Each winner receives recognition at an upcoming awards ceremony, along with a commemorative medallion and a \$5,000 award.

The Chancellor's Council raises funds for student scholarships and recruitment, faculty awards and support, and other programs of excellence.

Congratulations, Dr. Ancell!

NWI welcomes: Maggie Gilchrest, M.A.



(Left) - Maggie Gilchrest.

NWI is happy to announce that **Maggie Gilchrest** has joined our team working hard to meet your needs:

Maggie Gilchrest (top left) — Advisor for the BSWE program.

Maggie will be working closely with NWI's Lead Academic Advisor Kacey Young.

Maggie has a Master's degree in Interdisciplinary Studies with a focus in Military History, Modern Conflict and other related fields.

She is currently pursuing a Ph.D. in Higher Education.

WELCOME ABOARD!

NWI's Carsten Westergaard partners with Israeli company for LIDAR study on wind farms



As wind farms proliferate across the plains of West Texas, wind turbine wake is a significant problem affecting the energy output of wind turbines downstream—a challenge that is currently one of the largest in the wind industry field today.

Dr. Carsten Westergaard, Professor of Practice with the National Wind Institute and in the Department of Mechanical Engineering, has partnered with Pentalum Technologies of Rehovet, Israel, to use light detection and ranging (or LiDAR as it's commonly known) to measure the wake produced by wind turbines in the hope of eventually reducing that wake and helping wind farms become more efficient.

The collaboration between the two is bolstered by a \$900,000 grant from the U.S. Department of Energy's Binational Industrial Research and Development (BIRD) Energy Program which supports the federal government's efforts to combat climate change through the development of alternative energy sources. The U.S.-based program links research groups together with technology companies through the DOE and through Israel's Ministry of National Infrastructure, Energy and Water Resources.

Dr. Westergaard will work with Pentalum to utilize an array of LiDARs for three to six months to collect data. Pentalum has technology which is an ideal fit for Dr. Westergaard's project on many terms, including its much lower cost. Dr. Westergaard had known of Pentalum's success in this area, and so it became a natural fit to partner with them for this project through the DOE's BIRD program which brings both researchers and technology companies together to work on a common project.

Dr. Westergaard is planning on using up to 10 LiDAR units for this project, which will help to gather accurate data and also provide a testing ground for Pentalum to develop accurate instrumentation platforms that researchers will be able to utilize in future projects.

With the help of Dr. Jon White with Sandia National Laboratories, Dr. Westergaard is planning to get the LiDAR units in place and operational by the end of the spring semester.

(Text credit: George Watson, TTU Office of Communications & Marketing.)

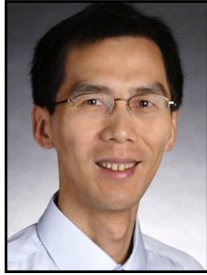
NWI GRANTS AND CONTRACTS — DECEMBER 2015/JANUARY 2016

Investigator	Unit	Credit	Award Amount Credited	Title	Agency	Project Period
Smith, D.A.	Civil, Env., Construction Eng.	50%	\$24,260.50	External Hazard Support - High Winds	Electric Power Research Inc	12/03/15-08/31/16
Barhorst, A.A.	Mechanical Eng.	50%	\$24,260.00	External Hazard Support - High Winds	Electric Power Research Inc	12/03/15-08/31/16
Morse, S.M.	Civil, Env., Construction Eng.	50%	\$22,500.00	NWI: Test Method for Determining Shear Modulus of Composite Interlayers	Eastman Chemical Company	12/08/15-12/07/16
Norville, H.S.	Civil, Env., Construction Eng.	50%	\$22,500.00	NWI: Test Method for Determining Shear Modulus of Composite Interlayers	Eastman Chemical Company	12/08/15-12/07/16
Ancell, B.C.	Geosciences	100%	\$124,120.00	NWI: Development of Probabilistic & Sensitivity-based Forecast Tools to Improve High-Impact Forecasting Guidance at the NWS	Ntl Oceanic & Atmospheric Administration	05/01/15-04/30/17

NWI SCHOLARLY UPDATE: DECEMBER 2015/JANUARY 2016



(Above) - Dr. Stephen Ekwaro-Osire,
ME and NWI faculty affiliate.



(Above) - Dr. Delong Zuo,
CE and NWI faculty affiliate.



(Above) - Dr. Xinzhong Chen,
CE and NWI faculty affiliate.

- **Stephen Ekwaro-Osire** (ME and NWI faculty affiliate) was a keynote speaker at the *Probabilistic Prognostics and Health Management of Energy Systems* workshop hosted by the Universidade Estadual Paulista in Brazil. The workshop was focused on the useful life of a wind turbine gearbox, and also included **Carsten Westergaard**, Professor of Practice with the NWI, Dr. Fisseha Alemayehu (Penn State Hazleton) and Dr. Shuangwen Sheng (from NREL).
- **Dr. Kishor Mehta** (CE Horn Professor and NWI co-founder) recently attended a meeting of the North Texas Chapter of Structural Engineering Association of Texas (SEAoT) on January 19-22 in Dallas. Dr. Mehta gave a lecture titled: "Future Buildings: Where does Structural Engineering Fit."
- **Dr. Kishor Mehta** also attended the Annual Meeting of the Academy of Medicine, Engineering and Science of Texas (TAMEST) where the Whitacre College of Engineering Dean, Dr. Al Sacco, gave a talk covering Materials in Space.
- **Drs. Delong Zuo and Xingzhong Chen** (both CE and NWI faculty affiliates) were recently invited to tour two NSF-funded Natural Hazards Engineering Research Infrastructure (NHERI) experimental facilities at the University of Florida and at Florida International University.
- **Dr. Delong Zuo (CE and NWI affiliate)** was recently invited to tour a NSF-funded National Hazards Engineering Research Infrastructure (NHERI) cyberinfrastructure facility at the University of Texas at Austin.

UPCOMING CONFERENCES/WORKSHOPS:

- The first speaker for the 2016 McDonald-Mehta Lecture Series is scheduled for 02/12. Dr. Joseph Minor, Consulting Engineer and co-founder of NWI. His lecture is title: "Discoveries Made While Researching..."
- NWI Weekly Seminar Series— Every Wednesday at 2:30 p.m in Room 120 in the Experimental Sciences Building on campus. Check out the schedule at www.wind.ttu.edu.
- WINDPOWER 2016, AWEA's annual national conference, is scheduled for May 23-26 in New Orleans, LA.
- 8th International Colloquium on Bluff Body Aerodynamics and Applications is scheduled for June 7-11 at Northeastern University in Boston, MA.

NWI Professor Doug A. Smith to study Halliburton tornado damage

Dr. Doug A. Smith, Professor in Civil Engineering and an NWI faculty affiliate, is one of a group of professors from West Texas A&M University, the University of Nebraska and Texas Tech University who are studying the "how" and the "why" of structural damage from the Nov. 16 tornado which destroyed much of the Halliburton plant outside of Pampa.

Dr. Smith's main focus of research is studying wind damage to help insurance costs lower, and he will be working with the group to study the wind damage using aerial imaging, drones, satellite technology, and laser scanning to study the scene. The goal of the study is estimate the wind speed it takes to damage structurally engineered metal buildings, and to hopefully shed some light on why some buildings were destroyed and some were not.

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). Go Red Raiders!