

Inside this issue:

- Guest Speakers 2
Provide Insight
- Q&A With Dr. 3
Yihong
- Spotlight On 4-
the Robotics 5
- Journals & 6-
Publications 7
- In Short News... 8

Texas State University Awarded Funding from U.S. Department of Agriculture

Dr. Tongdan Jin will team up with Dr. Luvi Sun from the Chemistry Department and Dr. Reed Richardson from the Agriculture Department in executing a \$480,000 four-year project aimed at providing a wide array of education and research experience to college students. The name of this project is BGREEN-Building a Regional Energy and Educational Network. Dr. Jin is confident that BGREEN “will become the leaders in clean energy and green technology in the 21st century.” Every year, 50 to 60 undergraduate and graduate students will participate in renewable energy research at the consortium universities. Students will have the opportunity to travel to Washington, D.C., and participate in workshops relevant to national and global energy policies.



Today renewable energy represents less than 5 percent of the energy portfolio in the world. It is anticipated that by the end of 2030, wind power, solar photovoltaics, hydro and other environmentally benign technology will produce more than 30 percent of electricity in the U.S. The BGREEN project is geared to the achievement of the national energy strategic goal. The project will help students, especially Hispanic and minority students, develop intellectual capabilities and research skills that are highly desirable for careers in renewable energy, sustainable manufacturing, green agriculture, government, or pursuit of advanced degrees in science and technology.

Dr. Karl Stephan to be Featured on TV show “Weird or What?”

On Friday, April 8, 2011 Professor Karl D. Stephan of the School of Engineering at Texas State University was interviewed for a documentary on ball lightning. A crew from Cineflix Inc. of Canada is producing episodes of the TV show *Weird or What?* which is hosted outside the U.S. by William Shatner. Professor Stephan has been conducting experimental research involving ball lightning and related subjects since 2007, and has published several

papers on the subject in scientific journals. The film crew asked him about an incident on a Canadian island in 1978 called the Bell Island Boom, which appears to have been an extremely powerful lightning strike that evidently produced ball lightning. Dr. Stephan also demonstrated for the crew how burning molten silicon produces brightly glowing white "fireballs" that may represent one type of ball lightning.



Guest Speakers Brent Strong and Brett Williams Offer Manufacturing Majors Valuable Insight

Dr. A. Brent Strong is a manufacturing engineering technology faculty member at the Ira Fulton College of Engineering and Technology at Brigham Young University (BYU), delivered two lectures in spring 2011: “Creativity in Engineering” and “Why Manufacturing Engineering as Major?”



Dr. Brent Strong

Creativity and engineering are closely linked, Strong says, but not in the minds of most people. Even many engineers misunderstand creativity and how it works within the engineering profession. The presentation outlined the basics of creativity and suggested ways that engineers can use creativity. He talked about choosing a career that uses creativity and how that can be applied to today’s industrial environment. He told the audience how an engineer could most effectively contribute to the strength of the U.S. economy and improve lives.

Strong’s lecture on choosing manufacturing engineering as a major was eye opening for students who are already in the major as well as those who are considering it. He laid out the growth and future of the manufacturing sector in the U.S. and mapped Maslow’s hierarchy of human needs (physiological, safety, social esteem and self-actualization) with manufacturing engineering as a career.

Dr. Strong is the founding director of the Advanced Composite Manufacturing and Engineering (ACME) Center, the Creativity Laboratory, the Manufacturing Leadership Forum, and the Rapid Product Realization Center, all at BYU. He is a widely recognized expert in plastics and composites. He has participated as an author, co-author or editor of 12 books, more than 100 peer-reviewed and invited papers, and is the inventor or co-inventor of 12 patents. In addition to his full-time university work, Dr. Strong continues to be active in business, serving on boards of directors and consulting for a number of companies.

Brett Williams, founding instructor of the SystemsGo Aerospace curricula, delivered a lecture on the SystemsGo Program at Fredericksburg High School and the school’s rockets competition. He addressed the state initiative that is changing public education in Texas, and the need for talented teachers from the engineering industries, proving that the U.S. can produce the most valued engineers and innovators to compete in the global arena of innovative technologies. He also discussed the opportunities for engineering majors to become high school science teachers.



Dr. Brett Williams

SystemsGo is an innovative, STEM-oriented, real world, project-based program that has received national recognition. It was developed to address the critical lack of engineers. The program has been recognized by the governor of Texas, the Texas Education Agency, the Texas Workforce Commission, NASA, and several industry leaders and organizations. Williams is currently directing SystemsGo’s efforts to introduce the program in schools across Texas as well as nationwide. See www.systemsgo.org for more information.

Williams has been working in Texas to promote R&D, testing and analysis, and innovation within high schools to help increase job skills for students heading into the workforce or academia. He is a graduate of Texas A&M University. He entered the educational arena 35 years ago and has received recognition as the Governor’s Star of Texas, H-E-B’s Rising Star for the State of Texas, Marshall Space Flight Center director’s commendation, and the American Institutes of Aeronautics and Astronautics’ National Educator Award. He teaches part-time at Fredericksburg High School.

The guest lectures were open to all engineering, technology and science majors. They were organized by Dr. Jitendra S. Tate and Mr. Esmer Trevino on behalf of Society of Manufacturing Engineers student chapter at Texas State.

Q&A With Dr. Yihong “Maggie” Chen

Dr. Chen joined the Ingram School of Engineering in fall 2009 as one of our electrical engineering faculty. She received her first PhD from Beijing University of Posts and Telecommunications as well as a second PhD from The University of Texas at Austin.

How would you describe your teaching style? What kind of methods do you use to engage students in learning?

After encountering numerous teachers from elementary school to graduate school, I deeply understand how meaningful a good teacher is to students. A criterion I apply to myself is, “What would I expect the teacher to be if I were the student in the class?” First of all, I believe that an instructor should evoke the interest of the student in the course materials. With interest, the students’ confidence can be built up, both in themselves and in the knowledge of courses; with interest, an active communication between the teacher and the students can be established with a solid foundation in the basic sciences and engineering skills.

I am able to adopt different styles of teaching when they are suitable to a particular situation and to meet the needs of the students. My teaching goals and methods address a variety of student learning styles. I believe concepts and principles are the most important things that students should acquire. Sharing my knowledge and expertise with students is very important to me. I want students to leave my courses well prepared for further work in the area.

I garner the attention of my students by asking questions, exploring options and suggesting alternative ways to do things. I combine the usage of latest technologies and traditional blackboard. I am approachable to my students, and show great interest in their progress. I solicit student advice about my teaching style, so that I can adjust at the early stages of the course.

What kind of research has interested you of late? What tools and resources do you utilize?

Recently, my research is focused in flexible electronic and flexible photonics devices. Most of the devices are geared toward phased-array radar application. In my research, high frequency microwave source, oscilloscopes, vector network analyzer, solid state laser, photodetector, EDFA, optical power meter, optical spectrum analyzer and electronic material deposition systems are the major equipments.

What student organizations are you associated with? What direction do you envision for these groups and why is it important that students participate in such activities?

I am associated with IEEE, and SWE. Student organizations are very important resources for students. They get to know the latest technologies, the society and even job opportunities.

What inspired you to become an educator? What are some of your goals as an educator?

I was a mentor for a few PhD students at UT Austin. There is nothing more rewarding than seeing the students achieve ever-higher distinction and share the excitement of learning with me. I am also enthusiastic about research, and I enjoy getting students involved in my research. My immediate goal is to offer students an opportunity to strengthen their understanding of engineering fields by working with other faculties in the Ingram School of Engineering. My long-term goal is to get the students prepared for even higher education through participation in my research.



Dr. Yihong “Maggie” Chen

Spotlight On The Robotics Laboratory

The Robotics Laboratory at Texas State University is engaged in advanced research involving robotics and industrial automation that will improve production efficiency, reduce production cost, release humans from harsh environments and enhance human safety. The research effort is focused on intelligent robotics in general industry, the oil and gas industry and the electronic industry.

Dr. Heping Chen is committed to developing advanced technology and applications in robots and automation, which is relevant to all students majoring in engineering and computer science. The mission of the robotics laboratory is to continue leading research in robotics and industrial automation.

The lab's wide range of equipment includes a Segway mobile platform (used as a mobile base to test robot navigation), ABB IRB123 and ABB IRB140 industrial robots (used in industrial automation), a wafer-handling robot and system, and a smart grid testing system.

Among the goals of this lab are to perform research in advanced technologies and methodologies in robotics and industrial automation, to develop advanced technology to serve industry, and to educate students in advanced technologies and methodologies in robotics and industrial automation.





Areas of Interest

- The modeling and analysis of the problems related to:
 - ◇ Green factories and automation
 - ◇ Sustainable lean manufacturing
 - ◇ Factory logistics
 - ◇ Supply chains
 - ◇ Automated material handling systems
 - ◇ Distribution centers
 - ◇ Pothovoltaics, wind turbines and other renewable sources of energy
- Design of statistical experiments
- Cost-of-ownership modeling
- Manufacturing applications of operations research
- Simulation modeling and analysis

For more information regarding the Robotics Lab at Texas State University-San Marcos, please contact:

Heping Chen, Ph.D., Director, Robotics Laboratory

Ingram School of Engineering, Texas State University-San Marcos, San Marcos, TX 78666

Phone: 512-245-8729 Fax 512-245-7771 email: bc15@txstate.edu

Recent Journals and Publications

H. Chen, J. Wang, G. Zhang and T. Fuhlbrigge, “Modeling and Analysis of Robotic Wheel Loading Process in Trim-and-Final Assembly”, *The International Journal of Industrial Robots*, Volume 38 issue 6, 2011.

H. Chen, W. Sheng, “Transformative CAD Based Industrial Robot Program Generation”, the *International Journal of Robotics and Computer-Integrated Manufacturing*, Volume 27 Issue 5, 2011.

H. Chen, W. Sheng, “Transformative Industrial Robot Programming in Surface Manufacturing”, the IEEE Conference on Robotics and Automation(ICRA2011), Shanghai, China, 2011.

H. Chen, J. Xiao, “Robust Compliant Assembly Automation Using an Industrial Robot”, the 6th IEEE Conference on Industrial Electronics and Applications (ICIEA 2011), Beijing, China, 2011.

H. La,R. Lim, **H. Chen**,W. Sheng, “Decentralized Flocking Control with a Minority of Informed Agents”, the 6th IEEE Conference on Industrial Electronics and Applications (ICIEA 2011), Beijing, China, 2011.

Clara Novoa, **Tongdan Jin**, “Reliability centered planning for distributed generation considering wind power volatilities,” *Electronic Power Systems Research*, vol. 81, no. 8, 2011, pp. 1654-1661.

Ningcong Xiao, Hong-Zhong Huang, Yanfeng Li, Liping He, **Tongdan Jin**, “Multiple failure modes analysis and weighted risk priority number evaluation in FMEA,” *Engineering Failure Analysis*, vol. 18, 2011, pp. 1162–1170.

Tongdan Jin, Liudong Xing, Ying Yu, “A hierarchical Markov reliability model for data storage systems with media self-recovery,” *International Journal of Reliability, Quality and Safety Engineering*, vol. 18, no. 1, 2011, pp. 25-41.

Ameri, F., McArthur, C., **Asiabanpour, B.**, and Hayasi, M. “A Web-based Framework For Semantic Supplier Discovery for Discrete Part Manufacturing”, *SME/NAMRC 39 Transaction*, 2011.

Asiabanpour,B., Wilson, T., “Building good quality prototypes for forensic face reproduction from low quality laser scanned files”, *International Journal of Rapid Manufacturing(IJRapidM)*, Vol. 2, Nos. 1/2, 2011.

Timothy Glen Conner, Matthew Loerwald, Mohammad Hayasi, **Bahram Asiabanpour**, “Layer Alignment and Lamination for the Fully Dense Freeform Fabrication (FDFF) Process”, 22nd International Solid Freeform Fabrication (SFF) Symposium, Austin, TX, 2011.

Mohammad Hayasi, **Bahram Asiabanpour**, “Adaptive Direct Slicing and Machine Path Generation for the Fully Dense Freeform Fabrication (FDFF) Process with the Variable Layers”, 22nd International Solid Freeform Fabrication (SFF) Symposium, Austin, TX, 2011.

Asiabanpour, B., “Integrating research and teaching activities in manufacturing engineering education”, High Impact Technology Exchange Conference (HI-TEC), San Francisco CA, 2011.

Jongweon Cho, Helin Cao, Wei Wu, **Qingkai Yu**, Esmeralda N. Yitamben, Brandon Fisher, Jeffrey R. Guest, Yong P. Chen and Nathan P. Guisinger, “Atomic-Scale Investigation of Graphene Grown on Cu Foil and the Effects of Thermal Annealing”, *ACS Nano*, 5 (2011) 3607.

Jifa Tian, Helin Cao, Wei Wu, **Qingkai Yu** and Yong P. Chen, “Direct Imaging of Graphene Edges: Atomic Structure and Electronic Scattering”, *Nano Letters*, accepted (2011).

Anton N. Sidorov, Andriy Sherehiy, Ruwantha Jayasinghe, Robert Stallard, Daniel K. Benjamin, **Qingkai Yu**, Helin Cao, Wei Wu, Zhihong Liu, Yong P. Chen, Zhigang Jiang and Gamini U. Sumanasekera, “Thermoelectric power of graphene as surface charge doping indicator”, *Applied Physics Letters*, 99 (2011) 013115.

Wei Wu, Luis A. Jauregui, Zhihua Su, Zhihong Liu, Jiming Bao, Yong P. Chen and **Qingkai Yu**, “Growth of Single Crystal Graphene Arrays by Locally Controlling Nucleation on Polycrystalline Cu using Chemical Vapor Deposition”, *Advanced Materials*, accepted (2011).

(Cover Report) **Qingkai Yu**, Luis A. Jauregui, Wei Wu, Robert Colby, Jifa Tian, Zhihua Su, Helin Cao, Zhihong Liu, Deepak Pandey, Dongguang Wei, Ting Fung Chung, Peng Peng, Nathan Guisinger, Eric A. Stach, Jiming Bao, Shin-shem Pei and Yong P. Chen, “Control and Characterization of Individual Grains and Grain Boundaries in Graphene Grown by Chemical Vapor Deposition”, *Nature Materials*, 10 (2011) 443.

K. D. Stephan, J. Klier, L. Komala-Noor, and J. Bunnell, “Quantitative intensity and location measurements of an intense long-duration luminous object near Marfa, Texas,” *Journal of Atmospheric and Solar-Terrestrial Physics*, vol. 73, pp. 1953-1958, Aug. 2010 (doi: 10.1016/j.jastp.2011.06.002).

- S. Hong, A. Johnson, H. Carlo, D. Nazzal, and **J. Jimenez**, "Optimising the location of crossovers in conveyor-based automated material handling systems in semiconductor wafer fabs," *International Journal of Production Research*, vol. 49, 2011, pp. 6199-6226.
- T. Jin**, N. Nalajala, **J. Jimenez**, "A Multi-criteria Approach to Performance-based Maintenance with Variable System Fleet," *9th International Conference on Reliability, Maintainability, and Safety*, Guiyang, China: 2011.
- L. Miller, A. Bradley, A. Tish, **T. Jin**, **J. Jimenez**, and R. Wright, "Simulating Conveyor-Based AMHS Layout Configurations in Small Wafer Lot Manufacturing Environments," *Proceedings of the 2011 Winter Simulation Conference*, Phoenix, AZ, USA: 2010, *To Appear*.
- C. Jacobs, **J. S. Tate**, B. Olson, N. Theodoropoulou, and J. Koo, "Thermal characterization of nylon 11 / nanographene platelet nanocomposites", article has been accepted in July 2011. *Journal of Nanoscience and Nanotechnology*, American Scientific Publishers.
- J. S. Tate**, D. Kabakov, and J. Koo, "Carbon/phenolic nanocomposites for ablative applications", *SAMPE Journal*, vol. 47, no. 3, pp. 36-43, May/June 2011.
- D. Kabakov, **J. S. Tate**, and J. Koo, "Effect of dispersion techniques on flammability and mechanical properties of phenolic/E-glass nanocomposites", *Journal of Fire Science*, Sage Publications, vol. 25, issue 5, 2011.
- J. S. Tate**, C. J. Jacobs, S. Gaikwad, B. Olson, W. Stapleton, N. Theodoropoulou, and J. Koo, "Thermal and electrical properties of Nylon 11/Nanographene Platelet Nanocomposites", *International SAMPE Symposium and Exhibition (ISSE 2011)*, Long Beach, CA, USA, May 23-26, 2011. ", ID#1262.
- J. S. Tate**, C. J. Jacobs, and J. Koo, "Dispersion of MWCNT in phenolic resin using different dispersion techniques and evaluation of thermal properties", *International SAMPE Symposium and Exhibition (ISSE 2011)*, Long Beach, CA, USA, May 23-26, 2011. ID#1261.
- Se-Hoon Lee, Prashant Majhi, Domingo Ferrer, Pui-Yee Hung, Jeff Huang, Jungwoo Oh, Wei-Yip Loh, Barry Sassman, Byoung-Gi Min, **Hsing-Huang Tseng**, Rusty Harris, Gennadi Bersuker, Paul D. Kirsch, Raj Jammy, and Sanjay K. Banerjee, "Impact of Millisecond Flash-Assisted Rapid Thermal Annealing on SiGe Heterostructure Channel MOSFETs with a High-K/Metal Gate," *IEEE Transaction of Electron Devices*, pp. 2917-2923, Vol. 58, No.9, September, 2011.
- Wei-Yip Loh, Kanghoon Jeon, Chang Yong Kang, Jungwoo Oh, Tsu-Jae King Liu, **Hsing-Huang Tseng**, Wade Xiong, Prashant Majhi, Raj Jammy, and Chenming Hu, "Highly scaled ($L_g \sim 40$ nm) Gate-last Si Tunnel Field Effect Transistors with $I_{ON} > 100 \mu A/\mu m$," *Journal of Solid-State Electronics*, In Press, Corrected Proof, Available online 12 July 2011.
- W. Stapleton**, **B. Asiabanpour**, **J. Jimenez**, Dugan Um, "An REU Experience With Micro Assembly Workcell Research" *American Journal of Engineering Education*.
- Stapleton, William**, "Development Of A Library For Teaching And Implementing Resource-Limited Embedded Systems," *The 2011 International Conference on Embedded Systems and Applications*. July 2011.
- Vederaman Sriraman, , **William Stapleton**, "Lessons Learned in Implementing and Accrediting a Manufacturing Engineering Program," *The 118th Annual ASEE Conference and Exposition*, June 2011.
- R. K. Pandey**, **William A. Stapleton**, Anup Bandopadyay, Ivan Sutanto, Soren Sprissler, Richard Wilkins, "Modifications of Non-linear I-V Characteristics of Iron Titanates Using Electric and Magnetic Fields for Novel Devices", (Invited Paper), *International Conference on Electroceramics (ICE 2011)*, accepted for publication December 2011.
- R. K. Pandey**, P. Padmini, P. Kale, J. Dou, C. Lohn, R. Schad, R. Wilkins and W. Geerts, " Multifunctional nature of modified Iron Titanates and their potential applications", *Ceramic Transactions*, Vol. 226, (2011), pp. 61-75; A John Wiley Publication.
- Jian Zhong, Sushma Kotru, Hui Han, **R. K. Pandey**, "Effect of Nb Doping on Highly {100}-textured PZT Films", *Integrated Ferroelectrics* (in press; expected date: Oct/Nov 2011).
- Mohammad Shamsuzzoha, Chandan Srivastava, Pranoti Kale, Padmini Periaswamy, Sushma Kotru and **Raghavendra Pandey**, "Observation of side bands modulated structure in FeTiO₃-Mn₂O₃ alloys", *Journal of microscopy and microanalysis*, vol. 17 (Suppl 2), 2011.
- Maggie Yihong Chen**, etc. "One stage pulse compression at 1554nm through highly anomalous dispersive photonic crystal fiber", Accepted, *Optics Express*
- Maggie Yihong Chen**, etc. "Conformal Ink-jet Printed C-band Phased-Array Antenna Incorporating Carbon Nanotube Field-effect Transistor Based Reconfigurable True-time Delay Lines", Accepted, *IEEE Transactions on Microwave Theory and Techniques*

Ingram School of Engineering

601 University Drive
RFM 5202
San Marcos, TX 78666

Phone: 512-245-1826
Fax: 512-245-7771
E-mail: engineering@txstate.edu

The Ingram School of Engineering offers three programs: Manufacturing Engineering, Industrial Engineering, and Electrical Engineering. These programs are designed to be student-centered, and are structured to provide extensive hands-on experience. All programs lead to a bachelor of science degree.

A Warm Welcome from the Ingram School of Engineering!

Dr. Semih Aslan received his BS in electrical engineering from Istanbul Technical University in 1994. He completed an MS in electrical engineering at Illinois Institute of Technology in 2003 and taught for a number of years before returning there to complete his PhD in computer engineering. After graduation, he worked as a Senior FPGA design engineer at Motorola, working on RF front end design systems, such as DUC, DDC, AGC, PA and DPDs in LTE and WiMAX systems, design and optimization of DSP, computer arithmetic and matrix operation algorithms. Most recently, Dr. Aslan was a post-doctoral research associate in the Department of Electrical and Computer Engineering at Illinois Institute of Technology.

His research interests include reconfigurable processing engines for area and power efficient arithmetic and matrix operations, hardware testing and verification on FPGA and



Dr. Semih Aslan

VLSI systems, video and image processing on FPGAs, embedded system design, microprocessors and microcontrollers, high level synthesis hardware design, computer architecture, RF front end systems for wireless communication and network on chip design.

Brad Johnson has been with Texas State University for seven years, starting at the library as systems support. He then moved to ITS working as a lab coordinator before working for the Ingram School of Engineering as lab coordinator.

He enjoys volunteering at Kyle United Methodist as youth director, trustee, and bassist in their Praise Band.

He and his wife have two children, Zach (12) and Vince (10).

Prior to working at Texas State University, Brad worked in the construction trades for U.S. contractors Brazos M&E and CMI welding. He joined the Navy in 1996 where he gained knowledge of electronics and computers.



Mr. Brad Johnson

In Short News...

- Congratulations to Drs. Jitendra Tate and Clara Novoa on receiving promotion and tenure this year.
- Be on the lookout for students who will be working on a new Victory Star for Jackson Hall.
- Congratulations to student Ralph Schultz for winning the SME Future Leaders of Manufacturing Scholarship and to Dr. Bahram Asiabanpour for winning the SME Faculty Professional Development Award.