

# Dr. Frank Fisher, Ph.D., Associate Professor

## ADDRESS

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## EDUCATION

### NORTHWESTERN UNIVERSITY

Evanston, IL

#### **Post-doctoral Research Associate, Department of Mechanical Engineering (September 2002 – July 2004)**

- Post-doctoral Advisors: Dr. Rodney S. Ruoff, Dr. L. Catherine Brinson
- Member of the BIMat (Biologically Inspired Materials) Center research team at Northwestern

#### **PhD in Mechanical Engineering (December 2002)**

- Dissertation Title: *Nanomechanics and the Viscoelastic Behavior of Carbon Nanotube-Reinforced Polymers*
- Advisor: Dr. L. Catherine Brinson

#### **MA in Learning Sciences (December 2000)**

- MA Project: *Learners and Learning in Bioengineering*
- Advisor: Dr. Penelope Peterson

#### **MS in Mechanical Engineering (December 1998)**

- MS Thesis: *Viscoelastic Behavior of Polymer Matrix Composites with Interphase Effects: Theoretical Models and Finite Element Analysis*
- Advisor: Dr. L. Catherine Brinson

### UNIVERSITY OF PITTSBURGH

Pittsburgh, PA

- BS in Mechanical Engineering (Summa Cum Laude), May 1995
- BS in Applied Mathematics (Magna Cum Laude), May 1995
- Phi Sigma Pi National Honor Society (Social Chair, Service Chair)
- Engineering Student Council (Academic Chair)

## PROFESSIONAL EXPERIENCE

- Interim Department Director, Department of Mechanical Engineering, Stevens Institute of Technology, Hoboken, NJ, April 2013 - present
- Associate Professor, Department of Mechanical Engineering, Stevens Institute of Technology, Hoboken, NJ, September 2010 - present
- Assistant Professor, Department of Mechanical Engineering, Stevens Institute of Technology, Hoboken, NJ, Aug 2004 – Aug 2010
- Post-doctoral Research Associate, Biologically Inspired Materials Center, Northwestern University, Evanston, IL, 2002-2004
- Graduate Research Assistant, Department of Mechanical Engineering, Northwestern University, Evanston, IL, 1995-1999, 2000-2002

## HONORS AND AWARDS

- 2014 Distinguished Faculty Mentor Award from the Stevens Student Government Association (SGA)
- 2011-16 Fulbright Specialist Roster, J. William Fulbright Foreign Scholarship Board
- 2009 NSF Faculty Early Career Development (CAREER) award
- 2009 Stevens Alumni Association Outstanding Teacher Award

- Appointed as an Affiliate Faculty Member of the Center for Innovation in Engineering and Science Education (CIESE) at Stevens, March 2012 – May 2013
- 2009 Ferdinand P. Beer and E. Russell Johnston Jr. Outstanding New Educator Award from the Mechanics Division of the American Society of Engineering Education (ASEE)
- Selected to participate in the National Academy of Engineering (NAE) first annual Frontiers of Engineering Education (FOEE) symposium (2009) - for faculty members in the first half of their careers who are engaged in interesting and effective innovations in engineering education
- Profiled as one of "Nation's Top Mechanical Engineers" by Investors Digest (April 6, 2011 issue)
- 2014 *Journal of Vacuum Science and Technology B* paper recognized as one of the "most read" articles in the journal (October 2014)
- 2012 *Nanotechnology* paper selected by the journal editor for inclusion in the exclusive *Highlights 2012* collection (<5% of over 1000 articles selected)
- 2011 *Smart Materials and Structures* paper recognized as one of the top 20 most cited articles published in 2011 (June 2013)
- 2011 *Smart Materials and Structures* paper recognized as being in the top 10% of all IOP paper downloads in the first quarter of Spring 2011
- 2008 *Smart Materials and Structures* 'a most-accessed article'
- Selected as an Honorary Member of the Gear & Triangle Honor Society at Stevens, for contributions to the campus and to student activities
- Harvey N. Davis Distinguished Teaching Assistant Professor award (2006)
- Travel funding to participate in the National Institute of Standards and Technology (NIST) Workshop on Materials Characterization for Nanoscale Reliability, August 14-16, 2007, Boulder, CO.
- NSF Tuition Fellowship to attend the NSF Summer Institute Short Course on Multiscale Modeling and Simulation of Nano Mechanics and Materials, June 7-11, 2004.
- Searle Center for Teaching Excellence Teaching Assistant Fellow (2000-2001, 2001-2002)
- Preparing Future Faculty Program certificate, Northwestern University, June 2000
- Nugent Teaching Assistant (Merit) Fellowship (Dept. of Mechanical Engineering, Northwestern)
- Walter P. Murphy Fellowship (Northwestern University)
- University Scholar (University of Pittsburgh, College of Arts and Sciences)
- Fesseden-Trott Scholarship (University of Pittsburgh, School of Engineering)

## RESEARCH INTERESTS

- Piezoelectric materials for energy harvesting applications
- Development of viscoelastic techniques to infer local polymer mobility in nanoreinforced polymers
- Development of models of describing the influence of nanoscale filler particles on the viscoelastic behavior of polymers
- Development of models describing the effective mechanical properties of carbon nanotube-reinforced polymers
- Development of viscoelastic constitutive models coupled with experimental and numerical verification
- Micromechanical models for composite and advanced materials
- Modeling of the aging response of polymeric materials

## TEACHING AND MENTORING EXPERIENCE

### STEVENS INSTITUTE OF TECHNOLOGY

Hoboken, NJ

Associate Professor, Department of Mechanical Engineering (Aug 1 2010 - current)

Assistant Professor, Department of Mechanical Engineering (Fall 2004 – July 31, 2010)

- ME 345 Modeling and Simulation: Junior level required course for Mechanical Engineering students covers modeling and simulation strategies including model-block building, logical and data modeling, validation, trade-off analysis, decision-making, input and output statistical analysis, and process/system optimization. The focus of the class is teaching higher-level abstract analysis tools and strategies which are discipline and software independent. Examples of these modeling and simulation strategies are demonstrated in a number of areas, including solid and fluid mechanics, biomechanics,

thermodynamics, heat transfer, and manufacturing. Several software packages, including CAD/CAE software, are used in the class.

- NANO 600 Nanoscale Science and Technology. Co-developed and co-taught new core course for Nanotechnology Graduate Program (NGP) at Stevens. The objective of the class is to introduce students to the fundamentals of unique properties of nanostructures, their synthesis, and their applications in areas such as electronics, photonics, robotics, biotechnology, and environmental technology. Students will be able to gain important insights into when and why size matters, how the materials properties can be engineered through size control, how various nanostructures can be made, and what are the opportunities and challenges in realizing the projected potential of nanotechnology in a broad spectrum of engineering and sciences.
- NANO 525 Techniques of Surface and Nanostructure Characterization. (Assisted Svetlana Sukhishvili with the development and teaching of the course.) The goal of the course is to introduce students to the fundamentals, instrumentation, and applications of common analytical tools for surface and nanostructure characterization. The students will acquire the knowledge necessary for the selection of most suitable techniques and for the interpretation of the resultant information relevant to surface science and nanotechnology. The course will consist of 60% of lectures and 40% of demonstration experiments at Stevens labs. Fisher has developed lectures on topics such as Atomic Force Microscopy (AFM) and Nanomanipulation.

#### **NORTHWESTERN UNIVERSITY**

Evanston, IL

Instructor, Department of Mechanical Engineering (Fall 2003)

- Taught Engineering Analysis III: System Dynamics, introducing students to the analysis of mechanical and electrical systems, conservation principles in Newtonian mechanics, and the numerical and analytical solution of ordinary differential equations
- Followed the peer instruction paradigm of teaching, where concept questions and group work are utilized to foster critical thinking and problem-solving skills in students as they work to develop an understanding of the course material
- Incorporated several technological tools as part of the class instruction, including daily Powerpoint slides and handouts of the lecture material, Blackboard® asynchronous discussion boards, and multimedia modules and enhanced lectures previously developed for the class
- Guest lecturer for several undergraduate (Engineering Analysis II: Statics and Dynamics, Mechanics of Materials) and graduate-level (Mechanics of Advanced Materials, Introduction to Nanotechnology) for classes taught within the Mechanical Engineering Department

#### **NORTHWESTERN UNIVERSITY**

Evanston, IL

Graduate Teaching Assistant Fellow, Searle Center for Teaching Excellence (2000, 2001)

Teaching Assistant, Department of Mechanical Engineering (September 1997 – December 2001)

Teaching Assistant, School of Education and Social Policy (Fall 2001)

- As a Graduate Teaching Assistant Fellow, designed and conducted workshops to prepare new Teaching Assistants in engineering and science disciplines
- Selected TA for pilot of Engineering Analysis II, part of the Engineering First curriculum development project at Northwestern.
- Served as head TA for EA II for 2 years, responsible for coordinating the efforts of all teaching assistants in addition to normal TA duties
- Nugent Fellowship Recipient (Spring 1998) for Engineering Analysis III.
- TA for various classes in the Mechanical and Civil Engineering departments: Continuum Mechanics, Introduction to Heat Transfer, Engineering Design and Communication, and Engineering Mechanics.
- TA for graduate level class in the School of Education and Social Policy (Interface Design for Interactive Learning Environments); responsible for significant upgrades to the syllabus, including required readings and the selection of software for student critiques

**ADVANCED STUDIES PROGRAM, ST. PAUL'S SCHOOL**

Concord, NH

Master Teacher (Summer 1998, Summer 1999)

- Developed and taught a five-week class (20 hrs/week) entitled "Introduction to Engineering" for gifted high school pre-seniors
- Course combined lecture, problem solving sessions, demonstrations, field trips, and hands-on projects to introduce students to various fields of engineering
- Topics covered during the class included: statics and dynamics of rigid bodies, conservation principles, vector calculus, computer programming, electrical circuits, and web programming

**NORTHWESTERN UNIVERSITY**

Evanston, IL

National High School Institute - Summer Program Instructor (Summer 1996, Summer 1997)

- Initiated and designed a course to introduce high school students to the field of mechanical engineering.
- Led independent research projects where students programmed a 3D particle dynamics code, which they used to analyze drag force effects

**UNIVERSITY OF PITTSBURGH**

Pittsburgh, PA

Undergraduate Teaching Assistant (September 1993 – May 1995)

- Prepared and led classroom recitation sections in college algebra and trigonometry
- Assisted in the development of a specialized "Computers in Calculus" program introducing students to computer-aided mathematical analysis.
- Conducted classroom training for future undergraduate teaching assistants and tutors.

**TEACHING INTERESTS**

- qualitative methods development for analysis of engineering student development and growth
- use of technology to enhance teaching methods for undergraduate engineering
- engineering curriculum development to better prepare students for careers in industry
- web-based, asynchronous, and long-distance teaching
- engineering outreach programs for younger, under-represented, and disadvantaged students

**GRADUATE STUDENT and POST-DOCTORAL ASSOCIATE MENTORING****Completed**

- Dr. G. Mago, PhD graduate, Department of Mechanical Engineering, Aug 2004-Dec 2008. "Processing-structure-property relationships for polymer nanocomposites." [currently Senior R&D Engineer, Lubrizol Advanced Materials, Avon Lake, OH]
- V. Challa, PhD graduate, Department of Mechanical Engineering, Aug 2004-Dec 2010. "Vibration energy harvesting for low power and wireless applications." [currently post-doctoral research associate, Interdisciplinary Microsystems Group, University of Florida]
- L. Dong, MS graduate, Department of Mechanical Engineering, December 2011. "Two dimensional resonance frequency tuning approaches for vibration energy harvesting"
- Youn-Su Kim, Post-doctoral Research Associate, Department of Mechanical Engineering, January 2010-December 2012. "Nanotechnology-enabled energy storage for energy harvesting applications".

**In progress**

- Lin Dong, PhD student, Department of Mechanical Engineering, Jan 2012-present. Tentative thesis title: "Ambient vibration energy harvesting".
- Jon Belkowitz, PhD student, Department of Mechanical Engineering, January 2010-present. Tentative dissertation title: "Nanotechnology-enhanced concrete".
- Junjun Ding, PhD student, Department of Mechanical Engineering, Aug 2010-present. Tentative thesis title: "MEMS-scale vibration energy harvesting".

- Zhen Wang, PhD student, Department of Mechanical Engineering, Aug 2010-present. Tentative thesis title: "Nano/micromechanical Modeling of Polymer Nanocomposites".
- Min Nie, PhD student, Department of Mechanical Engineering, Sept 2010-present. Tentative thesis title: "Applications of a Nano-Hybrid Shish-Kebab Formation for Polymer Nanocomposites".
- Jayadurga (Durga) Iyer, PhD student, Department of Mechanical Engineering, Sept 2011-present. Tentative thesis title: "Processing-Induced crystallization of semicrystalline polymer nanocomposites".

## GRADUATE STUDENT COMMITTEES AT STEVENS

- Ishan Wathuthanthri, PhD student, Department of Mechanical Engineering. 'Design of Interferometers for Large Area Nanopatterning' Advisor: Prof. Chang-Hwan Choi
- Siyang Yang, MS student, Department of Chemical Engineering and Materials Science. 'Oscillatory Shear Behavior of Concentrated Elastomeric Suspensions,' December 2014. Advisor: Prof. Dilhan Kalyon
- Spicer Bak, PhD student, Ocean Engineering. 'The Performance and Optimization Study of a Floating Bi-Modal Exoskeletal Buoy for Shore Protection', Advisor: Prof. Thomas Herrington
- Kitu Kumar, PhD student, Mechanical Engineering. 'Novel Synthesis Regimes of Graphene and Carbon Nanotubes Towards 3-D All-Carbon Nanoarchitectures', August 2013, Advisor: E.H. Yang
- Aliaksandr Zhuk, PhD student, Department of Chemistry, Chemical Biology and Biomedical Engineering, May 2013. 'Temperature-responsive polymers within layer-by-layer assemblies', Advisor: Prof. Svetlana Sukhishvili
- Jinwei Li, PhD student, Department of Mechanical Engineering, December 2012. 'Impact of TiO<sub>2</sub> Nanofiber on Performance of Dye Sensitized Solar Cell', Advisor: Prof. Yong Shi
- Ayo Omosebi, PhD student, Chemical Engineering. 'Patterning the cathode catalyst layer of a fuel cell for elevated power density', Advisor: Prof. Ron Besser
- Nan An, PhD student, Mechanical Engineering, Spring 2013. 'Coupled chemo-mechanics of thermo-oxidative aging in polymer matrix composites', Advisor: Prof. Kishore Pochiraju
- Xi Chen, PhD student, Mechanical Engineering, April 2012. 'Characterization and application of PZT nanofibers', Advisor: Prof. Yong Shi
- Nan Ai, PhD student, Interdisciplinary PhD Program [with a Concentration in Nanotechnology], December 2010. 'Individual carbon nanotubes for quantum electronic and quantum photonic devices'. Advisor: Prof. Stefan Strauf (Physics).
- Sarah E. Du, Department of Mechanical Engineering, March 2011, 'AC Electrokinetic Platform for Manipulation of Microfluids and Micro/Nanoparticles', Advisor: Souran Manoochehri
- Yao-Tsan (Anderson) Tsai, Department of Mechanical Engineering, 'Low-voltage Actuation of Liquid Droplets and its Applications on Clinical Diagnostics', Advisor: EH Yang
- Ishan Wathuthanthri, MS student, Department of Mechanical Engineering. Advisor: Prof. Chang-Hwan Choi
- Bo Kang, PhD student, Department of Chemical, Biomedical, and Materials Engineering. Advisor: Prof. Dilhan Kalyon
- Keqiang Hu, PhD student, Department of Civil, Environmental, and Ocean Engineering. Advisor: Prof. X. Frank Xu.
- Shiyu Xu, PhD student, Department of Mechanical Engineering, December 2009, 'Fabrication, Characterization, and Applications of PZT and ITO Nanostructures', Advisor: Prof. Yong Shi
- Seda Vural, MS student, Department of Chemical Engineering, September 2009, 'Effects of incorporation of multi-walled carbon nanotubes on the swelling, degradation and viscoelastic behavior of hydrogels', Advisor: Prof. Dilhan Kalyon.
- Seher Ozkan, PhD student, Department of Chemical Engineering and Materials Science, Dec 2008, 'Development of rheological characterization and twin-screw extrusion/spiral winding processing methods for functionally-graded tissue engineering scaffolds and characterization of cell/biomaterial interactions', Advisor: Prof. Dilhan Kalyon
- Yunn-Tzu (Eva) Yu, PhD student, Department of Mechanical Engineering, May 2007, 'Multi-scale study of moisture and gas diffusivity in polymeric matrix composites', Advisor: Prof. Kishore Pochiraju
- Keyur Shah, PhD student, Department of Chemical, Biomedical, and Materials Eng, Aug 2006. "Study of Thermal Integration Issues and Heat Loss Pathways in a Planar Microscale Fuel Processor: Demonstration of an Integrated Silicon Microreactor Based Methanol Steam Reformer", Advisor: Prof. Ron Besser
- Emre Demirkol, MS student, Department of Chemical, Biomedical, and Materials Engineering, Dec 2005. "Processing and rheological behavior of organomodified clay/polymer nanocomposites", Advisor: Prof. Dilhan Kalyon

## **UNDERGRADUATE SUMMER STUDENTS ADVISED AT STEVENS**

- Peter Smith, freshmen, Mechanical Engineering (Summer 2014): Shear-induced crystallization of semicrystalline polymer nanocomposites
- Chris Volz, freshmen, Mechanical Engineering (Summer 2014): Nano-hybrid shish-kebab polymeric nanostructures
- Daniel Wojciehowski, freshmen, Computer Engineering (Summer 2014): Nano-hybrid shish-kebab polymeric nanostructures
- Jessica Berg, freshmen, Mechanical Engineering (Summer 2013): Vibration Energy Harvesting Demonstration Team
- Allison Butler, freshmen, Mechanical Engineering (Summer 2013): Vibration Energy Harvesting Demonstration Team
- Danny Duenas, junior, Biomedical Engineering (Summer 2013): Nano-Hybrid Shish Kebab Structure Characterization
- Kaitlyn Halloran, junior, Mechanical Engineering (Summer 2013): Shear-induced Crystallization of Polypropylene
- Joseph Huyett, junior, Mechanical Engineering (Summer 2013): Towards the Development of Underwater Sensor Platforms
- Timothy Kliks, freshmen, Mechanical Engineering (Summer 2013): Vibration Energy Harvesting Demonstration Team
- Christopher Vaughn, freshmen, Electrical Engineering (Summer 2013): Vibration Energy Harvesting Demonstration Team
- Miles Winship, freshmen, Mechanical Engineering (Summer 2013): Vibration Energy Harvesting Demonstration Team
- Dylan Boyle, freshmen, Electrical Engineering (Summer 2012): Vibration Energy Harvesting System
- Anthony Cherone, freshmen, Chemical Engineering (Summer 2012): The Size Effect of Nano Silica on Mitigating Chemical Shrinkage in a Cement Composite
- Tatyana Fedorenko, freshmen, Mechanical Engineering (Summer 2012): Vibration Energy Harvesting System
- Henry Hernandez, sophomore, Mechanical Engineering (Summer 2012): 2D magnetic force modeling in COMSOL
- Alexander Thieke, freshmen, Mechanical Engineering (Summer 2012): Vibration Energy Harvesting System
- Drew Zahradka, freshmen, Mechanical Engineering (Summer 2012): Vibration Energy Harvesting System
- Henry Hernandez, freshmen, Mechanical Engineering (Summer 2011): 2D magnetic force modeling in COMSOL
- Jonathan Lee, freshmen, Mechanical Engineering (Summer 2011): An Excel-based Mori-Tanaka micromechanical model
- Brian Ginebaugh, freshmen, Mechanical Engineering (Summer 2011): An Excel-based Mori-Tanaka micromechanical model
- Joe Huyett, freshmen, Mechanical Engineering (Summer 2011): An autonomous vibration energy harvesting device
- Angela LoPiccolo, freshmen, Electrical Engineering (Summer 2011): An autonomous vibration energy harvesting device
- William J. Robbins, sophomore, Mechanical Engineering (Summer 2011): Autonomous system for piezoelectric energy harvesting
- Yang Park, junior, Mechanical Engineering (Summer 2011): Modeling of the CSH reaction in concrete
- Muhammad Nabil Bin Abdul Hamid, sophomore, Mechanical Engineering (Summer 2011): Development of a calorimeter for concrete characterization
- Steven Rawson, junior, Mechanical Engineering (Summer 2011): Development of a course on Alternative Energy for middle school science teachers
- Andres Paez, freshmen, Chemical Engineering (Summer 2011): SEM and TEM characterization of nanomaterials
- Juan C. Coronel, junior, Physics (Summer 2010): Autonomous system for piezoelectric energy harvesting
- Laura Barito, junior, Mechanical Engineering (Summer 2010): Shear-induced crystallization of semicrystalline polymer nanocomposites

- William J. Robbins, freshman, Mechanical Engineering (Summer 2010): Autonomous system for piezoelectric energy harvesting
- Travis J. Heithoff, senior, Mechanical Engineering (Summer 2010): Micromechanics modeling of polymer nanocomposites
- Alyssa Antropow, freshman, Chemistry (Summer 2010): CVD growth of carbon nanostructures
- David Barth, senior, Mechanical Engineering (Summer 2010): MEMS-scale intra-ocular pressure relief valve
- George Murillo, junior, Mechanical Engineering (Summer 2009): Moisture absorption in polymer nanocomposites
- Laura Barito, sophomore, Mechanical Engineering (Summer 2009): Virtual research experiences for undergraduates in nanotechnology
- Justin Richman, junior, Mechanical Engineering (Summer 2009): Spray apparatus for layer-by-layer assembly of polymer films
- Melissa Wiegand, freshmen, Electrical Engineering (Summer 2009): Characterization of piezoelectric polymers and polymer nanocomposites
- Erich Rau, junior, Mechanical Engineering (Summer 2009): CAE software learning modules for the undergraduate mechanical engineering curriculum
- Kevin Heany, sophomore, Mechanical Engineering (Summer 2009): Piezoelectric energy harvesting from environmental vibrations
- Catherine Galdun, sophomore, Chemical Biology (Summer 2008): Piezoelectric nanocomposites prepared using immersion precipitation technique
- Nicholas L. Walulik, freshmen, Mechanical Engineering (Summer 2008): Virtual research experiences for undergraduates in nanotechnology
- Ellyn Griggs, freshmen, Mechanical Engineering (Summer 2008): Virtual research experiences for undergraduates in nanotechnology
- Brandon Langley, junior, Electrical Engineering (Summer 2008): Piezoelectric-based vibrational energy scavenging
- Michael Whalen, freshmen, Chemical Engineering (Summer 2008): Non-isothermal crystallization studies of semicrystalline polymer nanocomposites
- Allyson Mackavage, freshmen, Chemical Engineering (Summer 2008): Non-isothermal crystallization studies of semicrystalline polymer nanocomposites
- Jerry Dutreuil, Mech. Eng. (Summer 2006 thru Summer 2008): Melt-mixing of polymer nanocomposites (Stevens Scholar)
- Ryan Oelkers, Chemistry (Summer 2006, Summer 2007): Solution-processing of MWNT-polymer nanocomposites (Stevens Scholar); New micromechanical models for polymer nanocomposites (Summer 2008, Summer 2009)
- Matthew Csengto, Mech. Eng. (Summer 2007): Processing of polymer nanocomposites (Stevens Scholar)
- David Barth, Mech. Eng. (Summer 2007-current): Imaging and nanomanipulation of nanomaterials and nanocomposites (Stevens Scholar)
- Elie Fonrose, Mech. Eng. (Summer 2007): Micromechanics techniques for polymer nanocomposites (ME Department funding)
- Marie-Joan Dutreuil, Elect & Computer Eng, (Summer 2006 – Summer 2007): Building a Nanotechnology Undergraduate Education (NUE) Learning Module
- Pete Stellato, Mech. Eng. (Summer 2006, Summer 2007): Piezoelectric energy harvesting (Stevens Scholar)
- Melissa Rhode, Mech. Eng. (Summer 2006): Viscoelastic characterization of polymers (Stevens Scholar)
- Nick Strand, Mech. Eng. (Summer 2006): Engineers Without Borders (EWB) Project Assessment (Technogenesis Support)
- Chloe Weck, Mech. Eng. (Summer 2006): Engineers Without Borders (EWB) Project Assessment (Technogenesis Support)

## **SENIOR DESIGN PROJECT ADVISOR**

- 2013-14: Project Persues: Michael Giglia (ME), Joseph Huyett (ME), Mark Siembab (ME)
- 2013-14: Sailboat Disablement: Paul Mascia (ME), Jonathan Samuel (ME), Jack vanRoden (ME)

- 2013-14: MATE (Marine Advanced Technology Education) Competition: Riaz Chowdhury (ME), Kevin Grudzinski (ME), Woosung Lee (ME), Stephanie Senkevich (ME), Christopher Stollen (ME)
- 2013-14: Vibration Energy Harvesting for Structural Health Instrumentation (VEHSI, co-advisor with M. Rutner, Civil Engineering): Joseph Gombar (ME), Diana Jandreski (ME), Curtis Stecyk (ME), Mark Conticchio (CE), John Murphy (CE), Lisa Tessitore (CE)
- 2012-13: Energy Harvesting Demonstration Unit: Joseph M. Bastelli (ME), John K. Lesch (ME), Pete Stackow (ME), Mark Roussey (ME)
- 2012-13: Human Powered Submarine: Kristopher Fonselius (ME), John (Jack) Lanigan (ME), Alex R. Pawlikowski (ME), Robert A. Truppner (ME)
- 2012-13: Autonomous Surface Vehicle (RoboBoats Competition): Muhammad Hamid (ME), Christopher Moyer (ME), John Santanello (ME), Maggie Weigel (ME)
- 2012-13: Therapeutic Toy for Children with Autism: Adam L. Marrakchi (ME), Mark Minervini (ME), Monica K. Ng (ME), Nicholas Stanton (ME)
- 2012-13: Energy Capture for Electronics Applications: Steven R. Czarnecki (ME), Timothy Schaaake (ME), David Williams (ME), Ryan M. Walsh (ME)
- 2012-13: Project Perseus: John Dubolsky (ME), Thomas D. McMenamin (ME)
- 2011-12: Autonomous Surface Vehicle (RoboBoats Competition): Richard Adamski Jr. (ME), Rei Darwin Flores (ME), Edmund Hofmann (ME), Travis Krichman (ME), Shawn Warren (ME)
- 2011-12: Therapeutic Toy Design for Children Affected by Autism: Kendra Appleheimer (ME), Magdalena Majcher (ME), Jessica Schneider (ME), Nicholas Walulik (ME)
- 2010-11: Unmanned Maritime System (RoboBoats Competition): Laura Barito (ME), Ernie Guismano (ME), Derek Straub (ME), Justin Wenthold (ME)
- 2010-11: Piezoelectric-based Energy Harvesting Demonstration Unit: Matthew Aiosa (ME), Vincent Allegro (ME), Peter Manse (ME), Andrew Saccamano (ME)
- 2010-11: Therapeutic Toy Design for Children Affected by Autism: Kevin Heaney (ME), Rowena Lee (ME), Stephanie Miller (ME)
- 2009-10: Layer by Layer Spray System: Daniel Buckey (ME), Ryan Savage (ME), Maria Hurtado (ME), Tyler Kimble (BT), John Kearns (BT)
- 2009-10: Energy Harvesting for Industrial Building Applications: Oscar Jimenez (ME), Peter Aquino (ME), Manuel Vargas (ME), Jonathan Szucs (ME), Sinthya Alvarado (ME)
- 2009-10: UMV: Unmanned Maritime Vessel: John P. Ostroski (ME), Daniel Ruland (ME), Cosimo A. Mastropierro (ME)
- 2009-10: Autonomous Design Competition: Andrew Hang (ME), Shannon McFadden (ME), Richard D'Antonio (ME)
- 2008-09: Energy Harvesting Demonstration Unit. Members: Chris Burgess (ME), Brian Friebel (ME), Alex Heckman (ME), Joe Liccardo (ME), Joe Pticar (ME)
- 2008-09: Engineers Without Borders – Organic Water Purification System. Members: Nick Faust (ME), Matt Fitzsimmons (ME), Andrew Wohl (ME), Matt Wilson (ME), Aaron Kalbermatten (ME), Brent Chanin (ME)
- 2007-08: Energy Harvesting Demonstration Unit. Members: Christopher Lee (ME), Daniel Cheng (ME), Parag Patel (ME), Reginald Wood (ME), 2007-08
- 2007-08: Piezoelectric-based Energy Harvesting. Members: Eric McCormick (ME), Jim Waterman (ME), Scott Hamilton (ME), David Manning (ME), Shingo Matsubara (ME), 2007-08
- 2007-08: Engineers without Borders. Members: Jonathan Da Silva (ME), Kim Fellenz (ME), Kevin Gonzalez (ME), Emanuel Rios (ME), 2007-08 (co-advised with S. Thangam)
- 2007-08: Formula SAE Car: E85 Fuel Conversion. Members: Joshua Guerra (ME), Colin Harrier (ME), William Mehnert (ME), Matthew Grywalski (ME), Jerry Dutreuil (ME), 2007-08 (co-advised with J. Nazalewicz)
- 2006-07: Piezoelectric-based energy harvesting. Members: Gerald Delatour II (ME), April Hartmann (ME), Dennis Lueken (ME), Giuseppe Vitamia (ME), Christopher Wightman (ME), 2006-07
- 2006-07: Engineers Without Borders: Hydroelectric system design. Members: Greg Maietta (Civ Eng), Nick Strand (ME), David Velasco (ME), Katie Weatherall (B&T 08), Chloe Weck (ME), 2006-07 (co-advised with S. Thangam)
- 2005-06: Self-Powered Systems: Prototype design for a MEMS-based energy scavenging device. Members: Keith McDougall (ME), John Sharon (ME), Rio Silitonga (ME), and Pete Worley (ME), 2005-06



## PATENT DISCLOSURES

- Invention Disclosure – Vibration Energy Harvesting for Structural Health Instrumentation (with M. Conticchio, J. Gombar, D. Jandreski, J. Murphy, C. Stecyk, L. Tessitore, L. Brunell, and M. Rutner), May 2014
- US Patent Application 14/019,799, Popcorn-Like Growth of Graphene-Carbon Nanotube Multi-stack Hybrid 3D Architecture for Energy Storage Devices (with Y.S. Kim, K. Kumar, and E.H. Yang), January 2012
- Resonant Frequency Tunable Energy Harvesting Device (with V. Challa, MG Prasad, and Y Shi), January 2007.

## BOOK CHAPTERS

3. J. Ding, V.R. Challa, M.G. Prasad, and F.T. Fisher (2012). "Vibration Energy Harvesting and its Application for Nano- and Microrobotics", in *Micro/Nano-robotics for Biomedical Applications*, Y. Guo (Editor), Springer Science+Business Media, LLC, New York.
2. F.T. Fisher and L.C. Brinson (2006). "Nanomechanics of Nanoreinforced Polymers", in *Handbook of Theoretical and Computational Nanotechnology*, M. Reith and W. Schommers (Eds.), American Scientific Publishing.
1. F.T. Fisher, D.A. Dikin, X. Chen, and R.S. Ruoff (2005). "Nanomanipulator Measurements of the Mechanics of Nanostructures and Nanocomposites", in *Applied Physics of Nanotubes: Fundamentals of Theory, Optics and Transport Devices*, Slava V Rotkin and Shekhar Subramoney (Eds.), Springer Series in Nanoscience and Technology.

## REFEREED JOURNAL ARTICLES

38. Z. Wang, R. Oelkers, K.C. Lee, and F.T. Fisher (2015). "Analytical solution for dilute strain concentration tensor for coated inclusions and applications for polymer nanocomposites: Part 2. Cylindrical inclusions", *Composites Science and Technology*, to be submitted
37. Z. Wang, R. Oelkers, K.C. Lee, and F.T. Fisher (2015). "Analytical solution for dilute strain concentration tensor for coated inclusions and applications for polymer nanocomposites: Part 1. Spherical inclusions", *Composites Science and Technology*, to be submitted
36. L. Dong, M. Grissom, M.G. Prasad, and F.T. Fisher (2015). 'Membrane vibration based energy harvesting system modeling', *manuscript in preparation*
35. L. Dong, M.G. Prasad, and F.T. Fisher (2015). 'Two dimensional resonance frequency tuning approach for vibration based energy harvesting', *manuscript in preparation*
34. M. Nie, D.M. Kalyon, and F.T. Fisher (2015). 'Polymer crystallization in a carbon nanofiber via nanocapillary flow', *to be submitted*
33. M. Nie, D.M. Kalyon, and F.T. Fisher (2014). 'Interfacial load transfer in polymer/carbon nanotube nanocomposites with a Nanohybrid Shish Kebab modification', *ACS Applied Materials & Interfaces*, **6**, 14886-14893.
32. J. Ding, K. Du, I. Wathuthanthri, C.H. Choi, F.T. Fisher, and E.H. Yang (2014). 'Transfer Patterning of Large-Area Graphene Nanomesh via Holographic Lithography and Plasma Etching', *Journal of Vacuum Science and Technology B*, **6** (32), 2166 [recognized by journal as a 'most read' article for month of October 2014]
31. K. Kumar, Y.S. Kim, X. Lin, J. Ding, F. T. Fisher, and E.H. Yang (2013). 'Chemical vapor deposition of carbon nanotubes on monolayer graphene substrates: reduced etching via suppressed catalytic hydrogenation using C<sub>2</sub>H<sub>4</sub>', *Chemistry of Materials*, **25**, 3874-3879.

30. J. Belkowitz, K. Nawrocki, R. Moser and F.T. Fisher (2014). 'An analysis of the impact of nano silica particle size on cement composites', *Journal for Sustainable Cement-Based Materials*, *in press*.
29. S.F. Bartolucci, G. Mago, F.T. Fisher, E. Troiano, and D.M. Kalyon (2012). 'Unusual fracture surface morphology of fatigued carbon nanofiber/poly(ether ether ketone) composites', *Carbon*, **50**, 2347. (cover article)
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- \*33. Z. Wang and F.T. Fisher (2014). "Analytical Solution of the Dilute Strain Concentration Tensor for Coated Cylindrical Inclusions, and Applications for Polymer Nanocomposites", Proceedings of ASME 2014 International Mechanical Engineering Congress & Exposition, November 14-20, Montreal, Canada
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## CONFERENCE AND TECHNICAL PRESENTATIONS<sup>1</sup>

63. F.T. Fisher, R. S. Besser, K. Sheppard, C.-H. Choi, and E.H. Yang (2014). "An Approach for Introducing Concepts of Nanotechnology within the Undergraduate Curriculum", ASEE Mid-Atlantic Section Fall 2014 Conference, November 14-15, Swarthmore College, Swarthmore, PA.
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59. F.T. Fisher, R. Besser, K. Sheppard, C.H. Choi, and E.H. Yang (2012). "A Program to Enhance Undergraduate Exposure to Nanotechnology", American Society for Engineering Education Fall 2012 Mid-Atlantic Conference, November 2-3, Ocean County College, Toms River, NJ.
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19. KC Lee and FT Fisher (2005). "Micromechanics modeling of nanotube-reinforced polymers", *2005 Joint ASME/ASCE/SES Conference on Mechanics and Materials (McMAT2005)*, June 1-3, Baton Rouge, LA.
18. W Ding, FT Fisher, X Chen, DA Dikin, and RS Ruoff (2004). "Nanotube-polymer Composite Characterization via Nanomanipulation Experiments", *11<sup>th</sup> US-Japan Conference on Composite Materials*, September 9-11, Yamagata, Japan.
17. Fisher, FT, Thillaiyan, R, Meade, L, Levy, B, Ruoff, RS, and LC Brinson (2003). "The impact of chemical functionalization on nanoparticle-reinforced polymers: Nanoscale characterization and effective mechanical properties", *18th American Society of Composites (ASC) Technical Conference*, October 20-22, Gainesville, FL.
16. Xu, T, Fisher, FT, Brinson, LC, and RS Ruoff (2003). "Bone-Shaped Nanomaterials for Nanocomposites Applications", *18th American Society of Composites (ASC) Technical Conference*, October 20-22, Gainesville, FL.

15. Fisher, FT, Ruoff, RS, and LC Brinson (2003). "Direct nanoscale observation of a non-bulk polymer interphase in nanotube-polycarbonate systems", *The 14th International Conference on Composite Materials (ICCM-14)*, July 14-18, San Diego, CA.
14. Fisher, FT, and LC Brinson (2003). "Macroscale experimental evidence of a reduced-mobility non-bulk polymer phase in nanotube-reinforced polymers", *44<sup>th</sup> AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*, April 7-10, Norfolk, VA.
13. Ruoff, RS, Xu, T, Kim, W-S, Fisher, FT, Brinson, LC (2002). "Ordered Carbon Nanotube Array Nanocomposites", *17<sup>th</sup> Annual Meeting of the American Society for Composites*, October 21-23, West Lafayette, IN.
12. Fisher, FT, and LC Brinson (2002). "Viscoelasticity and Physical Aging of Carbon Nanotube-reinforced Polymers", *SEM 2002 Annual Conference on Experimental and Applied Mechanics*, June 10-12, Milwaukee, WI.
11. Brinson, LC, and FT Fisher (2001). "Effects of Curvature on the Modulus of Nanoreinforced Polymers", *TMS 2001 Fall Meeting*, November 5-8, Indianapolis, IN.
10. Fisher, FT, and LC Brinson (2001). "Nano-, Micro-, and Macro-mechanics of Nanoreinforced Polymeric Materials", *NASA Langley Workshop on Nanotechnology - Computational Materials, Modeling, and Simulation*, October 16, Langley, VA.
9. Fisher, FT, and LC Brinson (2001). "Viscoelastic Response of Carbon Nanotube-reinforced Polymers", *6<sup>th</sup> US National Congress on Computational Mechanics*, August 1-3, Dearborn, MI.
8. Fisher, FT, and LC Brinson (2001). "Effects of Curvature on the Elastic Modulus of Carbon Nanotube-reinforced Polymers", *2001 Mechanics and Materials Summer Conference*, June 27-29, San Diego, CA.
7. Fisher, FT, and PL Peterson (2001). "Adaptive Learners and Learning in Bioengineering", presented at the symposium "Learning for the Future in Bioengineering: Building Bridges between Learning Scientists and Engineering Educators", *the 82<sup>nd</sup> Annual Meeting of the American Educational Research Association*, April 10-14, Seattle, WA.
6. Fisher, FT, and PL Peterson (2001). "Adaptive Expertise – A New Way to Think About Student Learning", *ASEE IL/IN Sectional Conference, March 29-31*, Purdue University, West Lafayette, IN.
5. Fisher, FT, Peterson, PL, Falk, CL, and D Kanter (2000). "Measuring Adaptive Expertise in Undergraduate Engineering Students", *BMES 2000, October 12-14*, Seattle, WA. (Poster Session)
4. Falk, CL, Fisher, FT, Peterson, PL, and D Kanter (2000). "Teaching Toward Adaptive Expertise in Bioengineering", *The World Congress on Medical Physics and Biomedical Engineering*, July 27, 2000, Chicago, IL.
3. Peterson, PL, and FT Fisher (2000). "Learners and Learning in Biomedical Engineering: Project Overview", *VaNTH Quarterly Meeting, July 26-27, 2000*, Northwestern University, Chicago, IL.
2. Fisher, FT (1999). "Influence of the Interphase in Polymer Matrix Composites", *the 36<sup>th</sup> Annual Technical Meeting of the SES*, Austin, TX.
1. Brinson, LC and FT Fisher (1997). "Combined Aging and Moisture Effects in Polymers and Polymer Matrix Composites", *the 1997 International Mechanical Engineering Conference and Exposition (IMECE 97)*, Dallas, TX.

## INVITED PRESENTATIONS

30. F.T. Fisher, "Leveraging Crystallization in Semicrystalline Polymer Nanocomposites", Rutgers University, October 22, 2014.
29. F.T. Fisher, "Multiscale Science and Engineering: Big Advances Coming From The NanoWorld", New Jersey City University (NJCU), September 19, 2012.
28. F.T. Fisher, "Nanoparticle-Enhanced Crystallization of Semicrystalline Polymer Nanocomposites", TMS Annual Meeting, March 11-15, 2012, Orlando, FL.
27. F.T. Fisher, "Nanoparticle-Enhanced Crystallization of Semicrystalline Polymer Nanocomposites", Department of Mechanical and Industrial Engineering, New Jersey Institute of Technology, November 2, 2011.
26. F.T. Fisher and E.H. Yang, "Graphene-Based Supercapacitors for Energy Harvesting Applications", US Army Armament Research, Development, and Engineering Center (ARDEC), Picatinny Arsenal, NJ, July 6, 2011
25. FT Fisher and V Challa. "Towards Microscale Ambient Vibration Energy Harvesting", December 7, 2010, E2 Micro/Nano Energy Harvesting Technology Workshop, Stevens Institute of Technology, Hoboken, NJ.
24. F.T. Fisher. "Towards semicrystalline polymer nanocomposites for vibration energy harvesting applications", Department of Mechanical Engineering and Materials Science and Department of Civil and Environmental Engineering (joint), Duke University, September 7, 2010.
23. F.T. Fisher. "Processing-Induced Crystallization of Semicrystalline Polymer Nanocomposites", 5th Annual Polymer Nanocomposites Conference, Lehigh University, March 8-10, 2010.
22. F.T. Fisher. "Virtual Research Experiences for Undergraduates in Nanotechnology", National Academy of Engineering (NAE) Frontiers of Engineering Education (FOEE) symposium, November 15-18, Herndon, VA
21. V Challa and F.T. Fisher. "Vibration Energy Harvesting using Magnetic Materials", November 2, 2009, Electron Energy Corporation, Landisville, PA.
20. FT Fisher. "Ambient Vibration Energy Harvesting", August 24, 2009, KCF Technologies, Inc, State College, PA.
19. FT Fisher and V Challa. "Ambient Vibration Energy Harvesting", June 2, 2009, E2 Alternative Energy Workshop, Stevens Institute of Technology, Hoboken, NJ.
18. FT Fisher. "Crystallization and Semicrystalline Polymer Nanocomposites", March 9, 2009, School of Polymer, Textile and Fiber Engineering, Georgia Institute of Technology, Atlanta, GA.
17. FT Fisher and DM Kalyon. "Processing of Semicrystalline Polymer Nanocomposites", October 15, 2008, Nanotechnology Information Exchange, Picatinny Arsenal, Picatinny, NJ
16. FT Fisher. "Current Research Opportunities in Polymer Nanocomposites", April 24, 2008, Ph.D. Nanoscale Science Seminar series, University of North Carolina at Charlotte.
15. V.R. Challa, M.G. Prasad, and F.T. Fisher (2008). "A High Efficiency Multi-beam Array Tunable Energy Harvesting Device for Powering Wireless Sensors", IEEE 17TH International Symposium on the Applications of Ferroelectrics (ISAF), February 24-27, Santa Fe, New Mexico

14. F.T. Fisher (2008). "Processing-induced crystallization of polymer nanocomposites" (invited, poster session), Gordon Research Conference on Composites (Nanocomposites), January 13-18, Ventura, CA.
13. FT Fisher. "Current Issues in Polymer Nanocomposites", November 30, 2007, Department of Mechanical Engineering, University of New Hampshire.
12. FT Fisher. "Current Issues in Polymer Nanocomposites", April 26, 2007, Department of Materials Science and Engineering, Rensselaer Polytechnic Institute.
11. FT Fisher. "Nanotechnology – A Primer", October 21, 2006, Emerging Technology Seminar and Workshop, Stevens Institute of Technology Executive Master of Technology Management Program.
10. FT Fisher. "The Nanotechnology of Nanocomposites", August 1, 2006, Automated Tooling Systems, Toronto, ON, Canada.
9. FT Fisher. "Viscoelastic Behavior of Polymer Nanocomposites", April 20, 2006, State University of New York at Stony Brook, Long Island, NY.
8. FT Fisher. "Mechanical Behavior of Polymer Nanocomposites", November 3, 2005, City College of New York, New York, NY.
7. FT Fisher. "A Perspective on Educational Technologies and the Future of Engineering Education", December 13, 2005, Research & Innovation in Engineering Education seminar, Stevens Institute of Technology.
6. FT Fisher. "Nanomechanics of Nanocomposites", October 26, 2005, Chemical, Biomedical, and Materials Department, Stevens Institute of Technology.
5. FT Fisher. "Nanotube-Reinforced Polymers", August 3, 2004, Americhem, Cuyahoga Falls, OH.
4. FT Fisher and JL Terry. "Peer Instruction and Web-based Enhancement of Undergraduate Engineering Courses: Practical Implementation", April 26, 2004, Purdue University, Department of Biomedical Engineering, West Lafayette, IN.
3. FT Fisher. "The Mechanical Behavior of Carbon Nanotube-Reinforced Polymers", January 27, 2004, University of Louisville, Department of Mechanical Engineering, Louisville, KY.
2. FT Fisher. "Mechanical Response of Nanotube-Polymer Systems", December 13, 2002, Oklahoma State University, Department of Chemistry, Stillwater, OK.
1. FT Fisher. "Biomedical Engineering Education: A Learning Sciences Perspective", March 29, 2001, Purdue University, Department of Biomedical Engineering, West Lafayette, IN.

## **SHORT COURSES/WORKSHOPS ATTENDED**

- Invited participant, First Annual Mechanical Engineering Department Chairs meeting, Friday August 22 - Saturday August 23, 2014, Northeastern University, Boston, MA
- Integration of Simulation Technology into Engineering Curricula (ISTEC): A University – Industry Workshop, July 22-23, 2011, Cornell University, Ithaca, NY
- National Institute of Standards and Technology (NIST) Workshop on Materials Characterization for Nanoscale Reliability, August 14-16, 2007, Boulder, CO
- NSF CAREER Proposal Writing Workshop, Hawaii Tokai International College, Honolulu, Hawaii, March 23, 2007.
- NSF Summer Institute Short Course on Multiscale Modeling and Simulation of Nano Mechanics and Materials, Northwestern University, Evanston, IL, June 7-11 2004. (NSF Fellowship covering tuition expense)

## PROFESSIONAL SERVICE

- Session Chair, 'Electric/Dielectric Nanocomposites', 28th Annual Technical Conference of the American Society for Composites (2013), September 9-11, State College, PA.
- Chair, American Society of Mechanical Engineering (ASME) Materials Division Polymers Technical Committee (7/2010-6/2012)
- Vice-Chair, American Society of Mechanical Engineering (ASME) Materials Division Polymers Technical Committee (7/2008-6/2010)
- Advisory Board, Pre-Engineering Program at Academies @ Englewood (High School), Englewood, NJ
- Session co-Chair, 'Processing of Nanocomposites II', 2012 TMS Annual Meeting, March 11 – 15, Orlando, FL
- Reviewer, ASME Society-Wide Micro/Nano Technology Student Poster Forum, 2011 ASME International Mechanical Engineering Conference and Exposition (IMECE), November 11 – November 17, Denver, CO
- Symposium Organizer, 'Polymer Nanocomposites for Energy Generation and Storage', 2011 ASME International Mechanical Engineering Conference and Exposition (IMECE), November 11 – November 17, Denver, CO
- Session co-Chair, 'Polymer Nanocomposites', 2011 ASME International Mechanical Engineering Conference and Exposition (IMECE), November 11 – November 17, Denver, CO
- Session co-Chair, 'Computers in Education General Technical Session II', 2011 ASEE Annual Conference, June 26-29, Vancouver, British Columbia, Canada
- Symposium Organizer, 'Polymer Nanocomposites: Structure and Function', 2011 Joint ASME/ASCE/SES Conference on Mechanics and Materials (McMAT2011), May 31 – June 2, 2011, Chicago, IL
- External International Reviewer: Science & Engineering Research Council (SERC), a part of the Agency for Science, Research & Technology (A\*STAR) of Singapore
- External Reviewer: Leaders Opportunity Fund (LOF), a program of the Canada Foundation for Innovation (CFI)
- Proposal Review Panel, Center for Functional Nanomaterials (CFN), Brookhaven National Lab (2009-11)
- Guest Editor, Journal of Nanomaterials, Special Issue on Polymer Nanocomposite Processing, Characterization, and Applications, to be published Spring 2010
- Topic co-organizer, "Nanocomposites", 2009 ASME International Mechanical Engineering Conference and Exposition (IMECE), November 13 – November 19, Lake Buena Vista, FL.
- US Army Engineer Research and Development Center (ERDC) Basic Research proposal review, 2009
- DOD Proposal reviewer, Strategic Environmental Research and Development Program (SERDP), 2009
- NSF Review Panelist, IIP SBIR/STTR, 2010, 2011
- NSF Review Panelist, CMMI Materials Processing and Manufacturing program, 2009
- Book proposal review, Wiley, 2009
- Member of Conference Committee, Stevens organizer/host, and Panelist, New Jersey Technology Council Nanotechnology Prototype Showcase, October 15 2008, held at Stevens Institute of Technology.
- Topic co-organizer, "Current Issues In Polymer Nanocomposites", 2008 ASME International Mechanical Engineering Conference and Exposition (IMECE), October 31 – November 6, Boston, MA.
- Session chair, "Active Nanocomposites", Society of Engineering Science 2007 Annual Conference, October 22-24, Texas A&M University, College Station, TX.
- Session organizer, "Active Nanocomposites III: Characterization of Carbon Nanotube-Based Composites", 2007 ASME Applied Mechanics and Materials Conference (McMAT2007), June 3-7, Austin, TX.
- Outside technical reviewer for the Maryland Industrial Partnerships Program at the University of Maryland (Summer 2007)
- Topic organizer, "Polymeric Materials", 2006 ASME International Mechanical Engineering Conference and Exposition (IMECE), November 5-10, 2006, Chicago, IL.
- Reviewed abstracts submitted to the ASEE National Conference, Chicago, IL, June 18-21, 2006
- Reviewed abstracts submitted to the ASME IMECE, Orlando, FL, November 5-11, 2005
- Session organizer, "Micromechanical and Multiscale Modeling of Nanoreinforced Polymers", 2005 American Society for Composites Annual Technical Conference, September 7-9, Drexel University, Philadelphia, PA.
- Symposium co-organizer, "Advanced Nanocomposite Systems", 2005 Joint ASME/ASCE/SES Conference on Mechanics and Materials (McMAT2005), June 1-3, Baton Rouge, LA.
- Reviewed journal articles submitted for publication in: Journal of Micromechanics and Microengineering, ASME Journal of Vibration and Acoustics, Composites Science and Technology, Journal of Polymer

Science Part B: Polymer Physics, Nanotechnology, Computer Methods in Applied Mechanics and Engineering, Polymer, Composites Part A, Composites Part B, Journal of Biomedical Nanotechnology, International Journal of Nanomedicine, Journal of Biomedical Materials Research Part A, Applied Physics Letters, Carbon, Journal of Nanoscience and Nanotechnology, International Journal of Nanomedicine, ePolymer, Journal of Composite Materials, Journals of Nanoparticle Research, Materials Chemistry and Physics, Materials Science and Technology, Macromolecular Engineering & Materials, Acta Mechanica, Computational Materials Science, Nanotechnology, Journal of Nanoscience and Nanotechnology, Journal of Applied Polymer Science, Journal of Materials Science, Smart Materials and Structures, Sensors and Actuators A, Measurement Science and Technology, ASME/IEEE Journal of Microelectromechanical Systems, IEEE Sensors Journal, Mechanics of Advanced Materials and Structures, Journal of Engineering Education, Nano Letters, and Nature Materials.

- Reviewed manuscript submitted to Encyclopedia of Biomaterials and Biomedical Engineering.
- Reviewed abstracts submitted to the 44th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference in Norfolk, VA, April 7-10, 2003
- Reviewed technical proposals submitted to: U.S. Civilian Research and Development Foundation (CRDF): 2004, 2008

## UNIVERSITY/SCHOOL/DEPARTMENT SERVICE

- Appointed Interim Director, Department of Mechanical Engineering, April 2012
- *Last Lecture: The Road I've Driven (So Far)*, invited by the Order of Omega at Stevens Institute of Technology, December 4, 2014
- Appointed to the Search Committee for Vice Provost of Academics, November 2012
- Elected to the Executive Committee of the Stevens Faculty Senate, December 2011
- Faculty representative, Strategic Planning Steering Committee and Chair of the Undergraduate Studies Enterprise Sub-committee, 2011-12.
- Appointed as an Affiliate Faculty Member of the Center for Innovation in Engineering and Science Education at Stevens, March 2012 – May 2013
- Faculty representative on Academic Colloquium held in conjunction with the Inauguration Ceremonies of Dr. Nariman Farvardin, the Seventh President of Stevens Institute of Technology, October 14, 2011
- Faculty representative, Presidential Search Committee, 2010
- Elected to the Institute-wide Faculty Position on the Stevens Board of Trustees Strategic Planning Committee (2010-11)
- Program Committee, interdisciplinary Science & Engineering Foundations for Education (SEFE) Program Graduate Certificate
- Senior Personnel, NSF Math-Science Partnerships (MSP) Program, *PISA<sup>2</sup>: Partnership to Improve Student Achievement in Physical Sciences: Integrating STEM Approaches*, 5 year, \$11.5M grant (Prof. Ed Whittaker, PEP, PI, with T. Herrington, R. Besser, and B. McGrath, CIESE)
- Faculty Mentor, Women's Softball Team (Fall 2012 – current)
- Co-Director, Nanotechnology Graduate Program (NGP) at Stevens (Spring 2007-current)
- Member of Conference Committee, Stevens organizer/host, and Panelist, New Jersey Technology Council (NJTC) Nanotechnology Prototype Showcase, October 15 2008, held at Stevens Institute of Technology.
- Faculty Advisory Committee, Office of Sponsored Research (OSR) (Spring 2008-current)
- The Laboratory for Multiscale Imaging (LMSI) Advisory Board (Spring 2008-current)
- Metro Area MEMS/NEMS Workshop Co-Coordinator, July 23, 2007
- Member, School of Engineering Dean search committee (Spring 2007)
- Faculty Working Group, Middle States Commission on Higher Education Evaluation Committee (AY 07-08)
- Stevens Faculty Committee on Academic Appeals (elected, 2006-08; elected chair Dec 2007)
- Co-lead Freshmen Advisor, Department of Mechanical Engineering (Fall 2006 – current)
- Mechanical Engineering Seminar Series Organizer (Spring 2006 – current)
- Nanotechnology Graduate Program Seminar Series Organizer (Summer 2006 – current)
- Tau Beta Pi Advisory Committee, Stevens chapter (Spring 2006 – current)
- Tau Beta Pi District 2 Spring Conference, Keynote Address, February 16-17, 2008, Stevens Institute of Technology, Hoboken, NJ
- Pi Tau Sigma faculty co-advisor (Spring 2006 – current); Faculty attendee, 2006 Pi Tau Sigma National Conference.

## **SYNERGISTIC EDUCATIONAL ACTIVITIES**

- Invited talk, 'Introduction to Engineering and Nanotechnology', keynote speaker for the Center for Initiatives in Jewish Education (CIJE) engineering project symposium, May 31, 2012.
- GK12: NJ Alliance for Engineering Education (NJAE) (co-PI), NSF DGE-0742462, 01/07/08 – 12/31/12, \$2,999,962.
- Senior Personnel and Member of the Executive Committee, NSF Math-Science Partnerships (MSP) Program, *PISA<sup>2</sup>: Partnership to Improve Student Achievement in Physical Sciences: Integrating STEM Approaches*, 5 year, \$11.5M grant (Prof. Ed Whittaker, PEP, PI, with T. Herrington, R. Besser, and B. McGrath, CIESE)
- NUE: Nanotechnology EXposure for Undergraduate Students (NANO-NEXUS) (co-PI), NSF EEC-1138244, 09/01/11 – 08/31/13, \$200,000.
- NUE: Virtual research experiences for undergraduates in nanotechnology (VREUN) (PI), NSF ESI-0532555, 9/01/05-08/31/07, \$200,000.
- University faculty collaborator for the River Dell Regional High School entry into the Lemelson-MIT InvenTeam competition (contact: Dr. Chin Chu, Chemistry Teacher)
- Invited talk, 'Introduction to Nanotechnology', Center for Innovation in Engineering & Science Education 'Encouraging Students Toward STEM & IT Careers', workshop for New Jersey High School Guidance Counselors, March 23, 2010.
- Faculty participant, 17<sup>th</sup> Annual National Consortium for Specialized Secondary Schools of Mathematics, Science and Technology (NCSSSMST) Student Research Symposium, hosted at Stevens Institute of Technology, June 6-10, 2010.