

## Dr. Frank Fisher, Ph.D.

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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

- Assistant Professor, Department of Mechanical Engineering, Stevens Institute of Technology, Hoboken, NJ, Aug 2004 - current
- 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

- 2009 NSF Faculty Early Career Development (CAREER) award
- 2009 Stevens Alumni Association Outstanding Teacher Award
- 2009 Ferdinand P. Beer and E. Russell Johnston Jr. Outstanding New Educator Award from the American Society of Engineering Education (ASEE)
- 2008 *Smart Materials and Structures* 'a most-accessed article' (in the area of energy harvesting; see Paper 16 in Refereed Journal Articles below)
- 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)

## FUNDED PROJECTS

- Processing of PEEK Nanocomposites (PI, with Kalyon), US Army Benet Laboratories ILIR (In-house Laboratory Independent Research (ILIR)) through Picatinny Arsenal, \$30k, 01/01/09-09/01/09
- Processing of PEEK Nanocomposites (PI, with Kalyon), US Army Benet Laboratories ILIR (In-house Laboratory Independent Research (ILIR)) through Picatinny Arsenal, \$15k, 01/01/08-09/01/08
- MRI: Acquisition of an Inductively Coupled Plasma (ICP) Etcher for Nano/Micro Device Fabrication (co-PI, with Shi (PI), Yang, Choi, and Strauf), NSF ECCS-0821606, \$190,000, 09/01/08-08/31/11
- GK-12: New Jersey Alliance for Engineering Education (co-PI, with Chassapis (PI), Esche, McGrath, and Stolkin), NSF, 01/07/08 – 12/31/12, \$2,999,678
- Ultra-High-Speed Single Electron Memory Devices based on Carbon Nanotube Quantum Dots (co-PI, with Yang (PI), Strauf, and Choi (U. Idaho), Air Force Office of Scientific Research, 03/01/08-02/28/11, \$273,254
- Low Cost Manufacturing of Termobaric Explosives (co-PI, with Kalyon (PI)), W15QKN-05-D-0011, Task 25, US Army Benet Laboratories through Picatinny Arsenal, 01/01/08-09/01/08, \$15,000
- MRI: Acquisition of an instrument for nanoscale manipulation and experimental characterization (PI), NSF DMI-0619762, 09/01/06-08/31/09, \$326,700.
- NUE: Virtual research experiences for undergraduates in nanotechnology (PI), NSF ESI-0532555, 9/01/05-08/31/07, \$200,000
- Microdevice laboratory (co-PI), US Army TACOM-ARDEC, 09/13/05-09/12/06, \$475,573
- A framework for an online undergraduate engineering program: Planning study to determine how best to develop, implement and assess (co-PI), NSF EEC-0530626, 09/01/05-08/31/06, \$99,967
- Multimedia learning modules for virtual experiential engineering and incorporation into the undergraduate curriculum (PI), State of NJ Department of Treasury (through Center for Innovation for Science & Engineering Education, Stevens), 05/01/05-07/31/05, \$32,108
- Self-directed engineering software learning modules for engineering education (PI), State of NJ Department of Treasury (through Center for Innovation for Science & Engineering Education, Stevens), 05/01/05-07/31/05, \$26,109

## RESEARCH EXPERIENCE

### NORTHWESTERN UNIVERSITY

Evanston, IL

Post-doctoral Research Associate (September 2002 – July 2004)

- **Research member of the BIMat (Biologically Inspired Materials) Center at Northwestern**
- Conducted macroscale mechanical experiments (DMA, Minimat tensile test) studying the mechanical/viscoelastic response of carbon nanotube-reinforced polymers, collaborating with researchers at Northwestern, RPI, NASA, Oklahoma, Oklahoma State, Virginia Commonwealth, Loiusville, Florida State, Michigan Tech, and the Universidad Autonoma de Querataro
- Worked on several novel carbon nanotube-polymer composite processing techniques with the goal of greatly increasing the weight fraction of nanotubes within the composite.
- Assisted in the preparation of proposals submitted to NASA, NSF, DOD, AFOSR, and ARO.
- Supervised graduate and undergraduate students working in the Ruoff and Brinson groups.

### NORTHWESTERN UNIVERSITY

Evanston, IL

Graduate Research Assistant (September 1995 – September 2002)

- Conducted experimental investigations (DMA, DSC) studying the mechanical response of carbon nanotube-reinforced polymer

- Developed analytical models describing the impact of embedded carbon nanotubes on the elastic and viscoelastic response of polymeric materials
- Performed nanoscale characterization of nanotube dispersion in nanotube-reinforced polymers using SEM and TEM
- Assembled an experimental lab facility to model the coupling of environmental conditions and mechanical behavior in polymeric materials.
- Extended elasticity solutions to study the influence of a finite interphase region in fibrous composites, and compared results to a Finite Element Method analysis.
- Studied the effect of absorbed moisture on the temperature shift factors describing viscoelastic behavior of thin-film polymers.

#### **BETTIS ATOMIC POWER LABORATORY**

West Mifflin, PA

Associate Engineer (summer intern – Summer 1994, Summer 1995)

- Developed experiments to test enhancement techniques applied to nucleate boiling heat transfer surfaces.
- Designed experimental matrix to assess the thermal and mechanical characteristics of novel ceramic coatings.
- Conducted variable thermal conductivity bench top experiments, including material performance testing and confirmation of new design concepts.

### **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

Assistant Professor, Department of Mechanical Engineering (Fall 2004 - current)

- 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 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]

### In progress

- V. Challa, PhD student, Department of Mechanical Engineering, Aug 2004-current. Tentative dissertation title: "Energy harvesting based on ambient vibrations for low power applications."
- Kon-Chol Lee, PhD student, Interdisciplinary Engineering, Aug 2004-current. Tentative project: "Interphase characterization for polymer nanocomposites" (medical leave since Nov 2005)

## GRADUATE STUDENT COMMITTEES AT STEVENS

- Shiyu Xu, PhD student, Department of Mechanical Engineering. Advisor: Prof. Yong Shi
- 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
- 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.
- 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
- Guy Lagomarsimo, PhD student, Department of Civil, Environmental, and Ocean Engineering. Advisor: Prof. Sophia Hassiotis
- Keyur Shah, PhD student, Department of Chemical, Biomedical, and Materials Engineering, 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

- George Murillo, junior, Mechanical Engineering (Summer 2009): Moisture absorption in polymer nanocomposites
- Laura Barito, junior, 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
- Elyn 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)
- Chloe Weck and Nick Strand, Mech. Eng. (Summer 2006): Engineers Without Borders (EWB) Project Assessment (Technogenesis Support)

## **MISCELLANEOUS UNDERGRADUATE STUDENTS MENTORED AT STEVENS**

### **NUE PROJECT**

- Brandon Langley (Electrical Engineering, '10)
- Mo Amin (Mechanical Engineering, '08)

### **UNDERGRADUATE HONORS (H186) PROJECTS**

- Kevin Heaney, Mechanical Engineering junior, project title: Energy Harvesting from the Environment
- Jorge DaSilva, Mechanical Engineering junior, project title: Energy Scavenging Devices
- George Murillo, Mechanical Engineering junior, project title: Mechanical Characterization of Polymeric Materials
- Ryan Oelkers, Chemistry / Biomedical Engineering junior, project title: Immersion-Precipitation of PVDF Nanocomposites

### **MISCELLANEOUS PROJECTS**

- Faris Mohd Fauzi, Mech. Eng. (Fall 2006 – Spring 2007): Computer Aided Engineering learning module development (ME Department funding)

## SENIOR DESIGN PROJECT ADVISOR

- 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

## MISCELLANEOUS STUDENTS ADVISED AT STEVENS

- Mo Aiello, Frankie Bienek, Jonathan Chan, Michael Cruz, Mickael Etkin, Moaaz Kohsul, Richard Samarakone (Academic Year 08-09), High School Students, Academy for the Advancement for Science and Technology at the Bergen County Academies, Senior Experience in Nanotechnology
- Paras Bhatt, Jillian Cardamone, Hardik Jogani, Jose Romero (Academic Year 07-08), High School Students, Academy for the Advancement for Science and Technology at the Bergen County Academies, Senior Experience in Nanotechnology
- Adam Kohn (Academic Year 06-07), High School Student, Academy for the Advancement for Science and Technology at the Bergen County Academies, Senior Experience in Nanotechnology

## PATENT DISCLOSURES

- Resonant Frequency Tunable Energy Harvesting Device (with V. Challa, MG Prasad, and Y Shi), January 2007.

## BOOK CHAPTERS

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 §

22. G. Mago, F.T. Fisher, and D.M. Kalyon (2009). "Deformation induced crystallization and associated morphology development of carbon nanotube - PVDF nanocomposites", *Journal of Nanoscience and Nanotechnology*, **9**, 3330-3340.

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§ Citations via Scopus as of June 18, 2009; 550 independent citations (not including self-citations of any of the authors). Hirsch  $h$ -index of 11 (One has index  $h$  if  $h$  of his  $N_p$  papers have at least  $h$  citations each, and the other ( $N_p - h$ ) papers have at most  $h$  citations each.).

21. G. Mago, D.M. Kaylon, and F.T. Fisher (2009). "Hybrid carbon nanofiber-PBT nanostructures produced via crystallization-induced functionalization", *Journal of Applied Polymer Science*, in press.
20. V. Challa, M.G. Prasad, and F.T. Fisher (2009). "Design and evaluation of a coupled piezoelectric-electromagnetic energy harvesting technique", submitted to *Smart Materials and Structures*, January 2009.
19. G. Mago, F.T. Fisher, and D.M. Kaylon (2008). "Effects of multiwalled carbon nanotubes on the shear-induced crystallization behavior of poly(butylene terephthalate)", *Macromolecules*, **41**, 8103.
18. T. Ramanathan, F.T. Fisher, R.S. Ruoff, and L.C. Brinson (2008). "Apparent enhanced solubility of single-wall carbon nanotubes in a deuterated acid mixture", *Research Letters in Nanotechnology*, **1**, 296928.
17. G. Mago, D.M. Kalyon, and F.T. Fisher (2008). "Membranes of Polyvinylidene fluoride (PVDF) and PVDF nanocomposites with carbon nanotubes via immersion precipitation", *Journal of Nanomaterials (special issue on Nanomechanics and Nanostructured Multifunctional Materials)*, **3**, 759825.
16. V. Challa, Y. Shi, M.G. Prasad, and F.T. Fisher (2008). "A vibration energy harvesting device with bi-directional resonance frequency tunability", *Smart Materials and Structures*, **17**, 015035. (6 cites) [featured by the journal as a "most-accessed article" for Year 2008]
15. F.T. Fisher, R. Oelkers, and K.C. Lee (2008). "Analytical solution for dilute strain concentration tensor for coated inclusions and applications for polymer nanocomposites: Part 2. Cylindrical inclusions", *Mechanics of Materials*, to be submitted Summer 2009.
14. F.T. Fisher, R. Oelkers, and K.C. Lee (2008). "Analytical solution for dilute strain concentration tensor for coated inclusions and applications for polymer nanocomposites: Part 1. Spherical inclusions", *Mechanics of Materials*, to be submitted Summer 2009.
13. T. Ramanathan, F.T. Fisher, R.S. Ruoff, and L.C. Brinson (2005). "Amino-functionalized carbon nanotubes for binding to polymers and biological systems", *Chemistry of Materials* **17** (6), 1290-1295. (93 cites)
12. A. Eitan, F.T. Fisher, R. Andrews, L.C. Brinson, and L.S. Schadler (2006). "Reinforcement mechanisms in MWCNT-filled polycarbonate", *Composites Science and Technology*, **66**, 1159-1170, 2006. (20 cites)
11. S. Lu, D. A. Dikin, S. Zhang, F.T. Fisher, J. Lee, and R. S. Ruoff (2004). "Realization of nanoscale resolution with a micromachined thermally actuated testing stage", *Review of Scientific Instruments*, **75** (6), 2154-2162. (5 cites)
10. W. Ding, A. Eitan, F.T. Fisher, X. Chen, D.A. Dikin, R. Andrews, L.C. Brinson, L.S. Schadler, and R.S. Ruoff (2003). "Direct observation of polymer sheathing in carbon nanotube-polycarbonate composites", *Nano Letters* **3** (11), 1593-1597. (58 cites)
9. C. Velasco-Santos, A.L. Martinez-Hernandez, F.T. Fisher, R.S. Ruoff, and V.M. Castano (2003). "Improvement of thermal and mechanical properties of carbon nanotubes composites through chemical functionalization", *Chemistry of Materials* **15**, 4470-4475. (86 cites)
8. R.D. Piner, T.T. Xu, F.T. Fisher, Y. Qiao, and R.S. Ruoff (2003). "Atomic force microscopy study of clay nanoplatelets and their impurities", *Langmuir* **19** (19), 7995-8001. (17 cites)
7. F. T. Fisher, A. Eitan, R. Andrews, L.C. Brinson, and L. S. Schadler (2004). "Spectral response and effective viscoelastic properties of MWNT-reinforced polycarbonate", *Advanced Composites Letters*, **13** (2), 105-111. (3 cites)
6. T.T. Xu, F.T. Fisher, L.C. Brinson, and R.S. Ruoff (2003). "Bone-shaped nanomaterials for nanocomposite applications", *Nano Letters* **3** (8), 1135-1139. (20 cites)



5. C. Velasco-Santos, A.L. Martinez-Hernandez, F. Fisher, R. Ruoff, and V.M. Castano (2003). "Dynamical-mechanical and thermal analysis of carbon nanotube-methyl-ethyl methacrylate nanocomposites", *Journal of Physics D: Applied Physics*, **36**, 1423-1428. (36 cites)
4. F.T. Fisher, R.D. Bradshaw, and L.C. Brinson (2003). "Fiber waviness in nanotube-reinforced polymer composites: I. Modulus predictions using effective nanotube properties", *Composites Science and Technology*, **63** (11), 1689-1703. (70 cites)
3. R.D. Bradshaw, F.T. Fisher, and L.C. Brinson (2003). "Fiber waviness in nanotube-reinforced polymer composites: II. Modelling via numerical approximation of the dilute strain concentration tensor", *Composites Science and Technology*, **63** (11), 1705-1722. (28 cites)
2. F.T. Fisher, R.D. Bradshaw, and L.C. Brinson (2002). "Effects of nanotube waviness on the modulus of nanotube-reinforced polymers", *Applied Physics Letters*, **80** (24), 4647-4649. (75 cites)
1. F.T. Fisher and L.C. Brinson (2001). "Viscoelastic interphases in polymer matrix composites: Theoretical models and finite element analysis", *Composites Science and Technology*, **61**, 731-748. (32 cites)

## CONFERENCE PROCEEDINGS (\* peer-reviewed)

- \*24. V. Challa and F.T. Fisher (2009). "Design Considerations for MEMS Scale Vibration Energy Harvesting," ASME International Mechanical Engineering Conference and Exposition (IMECE), November 13-19, Lake Buena Vista, FL. (under review)
- \*23. V. Challa and F.T. Fisher (2009). "Towards a Self-Tunable Wide Frequency Bandwidth Vibration Energy Harvesting Device," ASME International Mechanical Engineering Conference and Exposition (IMECE), November 13-19, Lake Buena Vista, FL. (under review)
- \*22. K. Kumar, Y.T. Tsai, O. Sul, D.S. Choi, F.T. Fisher, M.G. Prasad, S. Strauf, and E.H. Yang (2009). "Nanoscale Graphene and Carbon Nanotube Lithography using an Atomic Force Microscope," ASME International Mechanical Engineering Conference and Exposition (IMECE), November 13-19, Lake Buena Vista, FL. (under review)
21. F.T. Fisher, E.H. Yang, Y. Shi, Z. Zhu, and H. Du (2009). "Nanoscale Manipulation and Characterization using a Nanomanipulator within a Scanning Electron Microscope," Proceedings of 2009 NSF Engineering Research and Innovation Conference, June 22-25, Honolulu, Hawaii.
20. E.H. Yang, S. Strauf, F. Fisher, D. S. Choi (2009). *Invited*. "Carbon-based Nano Devices for Sensors, Actuators and Electronics," Invited Paper, SPIE Defense and Security Symposium, Micro and Nanotechnologies for Defense and Security, Proceeding of SPIE, April 13-17, Orlando, FL [also covered in SPIE Highlight In the News, April 8 2009; <http://spie.org/x34283.xml?highlight=x2402&ArticleID=x34283>]
- \*19. G. Mago, D.M. Kaylon, and F.T. Fisher (2008). "Crystallization and morphology of carbon nanofiber-Nylon-11 nanocomposites", *American Chemical Society Fall Meeting & Exposition*, August 17-21, Philadelphia, PA.
- \*18. G. Mago, F.T. Fisher, and D.M. Kaylon (2008). "Effect of nanoparticles on microstructure and crystallization behavior of Polyvinylidene fluoride (PVDF) and PVDF nanocomposites membranes prepared using immersion precipitation technique", *American Chemical Society Fall Meeting & Exposition*, August 17-21, Philadelphia, PA.
17. V.R. Challa, M.G. Prasad, and F.T. Fisher (2008). "High efficiency energy harvesting device with magnetic coupling for resonance frequency tuning", SPIE Smart Structures/NDE, March 9-13, San Diego, CA

16. V.R. Challa, M.G. Prasad, and F.T. Fisher (2008). "Evaluation of coupled piezoelectric and electromagnetic technique for vibration energy harvesting", SPIE Smart Structures/NDE, March 9-13, San Diego, CA
15. V.R. Challa, M.G. Prasad, and F.T. Fisher (2008). *Invited*. "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. G. Mago, C. Velasco-Santos, A.L. Martinez-Hernandez, D.M. Kalyon, and F.T. Fisher (2007), "Effect of Functionalization on the Crystallization Behavior of MWNT-PBT Nanocomposites", Mater. Res. Soc. Symp. Proc., Vol. 1056E, 1056-HH11-352007, MRS Fall Meeting, November 26-30, Boston, MA.
13. V.R. Challa, M.G. Prasad, Y. Shi, and F.T. Fisher (2007). "Resonant frequency tunable vibration energy harvesting device", *The 6<sup>th</sup> International Workshop on Structural Health Monitoring*, September 11-13, Stanford University, Stanford, CA.
- \*12. G. Mago, J. A. Dutreuil, F.T. Fisher, and D.M. Kalyon (2007). "Structural formation in poly(butylene terephthalate) and PBT nanocomposites during uniaxial deformation", *ASME International Mechanical Engineering Conference and Exposition (IMECE)*, November 11-15, Seattle, WA.
- \*11. V.R. Challa, M.G. Prasad, Y. Shi, and F.T. Fisher (2007). "A wide frequency range tunable vibration energy harvesting device using magnetically induced stiffness", *ASME International Mechanical Engineering Conference and Exposition (IMECE)*, November 11-15, Seattle, WA.
- \*10. F.T. Fisher, H. Hadim, S. Esche, R. Ubell, and C. Chassapis (2007). "Feasibility of a fully online undergraduate mechanical engineering degree for non-traditional learners", 2007 American Society for Engineering Education Conference, June 24-27, Honolulu, HI.
9. G. Mago, F.T. Fisher, and D.M. Kalyon (2007). "Nanoparticle-enhanced shear-induced crystallization of semicrystalline polymer nanocomposites", *2007 Joint ASME/ASCE/SES Conference on Mechanics and Materials (McMAT2007)*, June 3-7, Austin, TX.
- \*8. G. Mago, F.T. Fisher, and D.M. Kalyon (2006). "Effect of shearing on the crystallization behavior of poly(butylene terephthalate) and PBT nanocomposites", *ASME International Mechanical Engineering Conference and Exposition (IMECE)*, November 5-10, Chicago, IL.
- \*7. FT Fisher and C Chassapis (2006). "Guided CAE software learning modules for the undergraduate mechanical engineering curriculum", 2006 American Society for Engineering Education Conference, June 18-21, Chicago, IL.
- \*6. F.T. Fisher, K.C. Lee, and L.C. Brinson (2005). "Elastic and Viscoelastic Properties of Non-bulk Polymer Interphases in Nanotube-reinforced Polymers", *SEM 2005 Annual Conference on Experimental and Applied Mechanics*, June 7-9, Portland, OR.
5. 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.
- \*4. FT Fisher, 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.
- \*3. FT Fisher 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.

\*2. FT Fisher and PL Peterson (2001). "A Tool to Measure Adaptive Expertise in Biomedical Engineering Students" *Multimedia Division (Session 2793) Proceedings for the 2001 ASEE Annual Conference*, June 24-27, Albuquerque, NM.

1. J Troy, B Reiser, D Kanter, J Kim, and F Fisher (2000). "From cells to systems: A learning module for bioengineering neural systems physiology". *Annals of Biomedical Engineering* **28** S-106 Abstract T10.4.

## CONFERENCE AND TECHNICAL PRESENTATIONS<sup>1</sup>

48. S.F. Bartolucci, G. Mago, H. Gevgilili, S. Vural, K. Dikovics, D.M. Kalyon, and F.T. Fisher (2009). "Investigation of the Properties of PEEK-Nanotube Composites Prepared by Solution Methods", ASME International Mechanical Engineering Conference and Exposition (IMECE), November 13-19, Lake Buena Vista, FL.

47. V. Challa and F.T. Fisher (2009). "Design Considerations for MEMS Scale Vibration Energy Harvesting," ASME International Mechanical Engineering Conference and Exposition (IMECE), November 13-19, Lake Buena Vista, FL.

46. V. Challa and F.T. Fisher (2009). "Towards a Self-Tunable Wide Frequency Bandwidth Vibration Energy Harvesting Device," ASME International Mechanical Engineering Conference and Exposition (IMECE), November 13-19, Lake Buena Vista, FL.

45. F.T. Fisher, S. Esche, B. McGrath, and C. Chassapis (2009). "GK-12: New Jersey Alliance for Engineering Education", NSF EEC Awardees Conference, February 2-3, Reston, VA.

44. F.T. Fisher and H. Man (2009). "NUE: Virtual Research Experiences for Undergraduates in Nanotechnology", NSF EEC Awardees Conference, February 2-3, Reston, VA.

43. G. Mago, D.M. Kalyon, and F.T. Fisher (2008). "Controllable nanocomposite interface microstructure via polymer crystallization-induced wrapping of carbon nanotubes", Proceedings of the 2008 MRS Fall Meeting, December 1-5, Boston, MA.

42. G. Mago, D.M. Kalyon, and F.T. Fisher (2008). "Characterization of crystal morphology and microstructure in semicrystalline polymer nanocomposites", *Society of Plastics Engineers EPS Division Topical Conference (TopCon)*, October 13-14, Wilmington, DE.

41. G. Mago, D.M. Kalyon, and F.T. Fisher (2008). "Polymer crystallization induced wrapping of carbon nanofibers", 2008 Virtual Conference on Nanoscale Science and Technology (VC-NST), July 23-28, University of Arkansas, Fayetteville, Arkansas.

40. G. Mago, D.M. Kalyon, and F.T. Fisher (2008). "Effect of nanoparticles on microstructure and crystallization behavior of Polyvinylidene fluoride (PVDF) and PVDF nanocomposites membranes prepared using immersion precipitation technique", *236th National Meeting & Exposition of the American Chemical Society*, August 17-21, Philadelphia, PA.

39. G. Mago, D.M. Kalyon, and F.T. Fisher (2008). "Crystallization and morphology of carbon nanotube-Nylon-11 nanocomposites", *236th National Meeting & Exposition of the American Chemical Society*, August 17-21, Philadelphia, PA.

38. S.F. Bartolucci, G. Mago, D.M. Kalyon, and F.T. Fisher (2008). "Mechanical Properties of Carbon Nanotube-PEEK Composites", *ASME International Mechanical Engineering Conference and Exposition (IMECE)*, October 31-November 6, Boston, MA.

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<sup>1</sup> F. T. Fisher or his students presented all talks listed here. Talks presented by colleagues and co-workers are not listed.

37. G. Mago, R. Oelkers, D.M. Kalyon, and F.T. Fisher (2008). "Microstructure and crystallization behavior of Polyvinylidene fluoride (PVDF) nanocomposites prepared using coprecipitation technique", *ASME International Mechanical Engineering Conference and Exposition (IMECE)*, October 31-November 6, Boston, MA.
36. V.R. Challa, M.G. Prasad, and F.T. Fisher (2008). *Invited*. "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.
35. G. Mago, C. Velasco-Santos, A.L. Martinez-Hernandez, D.M. Kalyon, and F.T. Fisher (2007). "Effect of Functionalization on the Crystallization Behavior of MWNT-PBT Nanocomposites", Proceedings of the 2007 MRS Fall Meeting, November 26-30, Boston, MA.
34. G. Mago, F.T. Fisher, and D.M. Kalyon (2007). "Effect of shearing on crystallization behavior and morphology of PVDF nanocomposites", *2007 Virtual Conference on Nanoscale Science and Technology (VC-NST)*, October 21-25, University of Arkansas, Fayetteville, Arkansas.
33. G. Mago, F.T. Fisher, and D.M. Kalyon (2007). "Nanoparticle-enhanced processing-induced crystallization of PVDF and PVDF nanocomposites", *44th Annual Technical Meeting of the Society of Engineering Science*, October 21-24, Texas A&M University, College Station, TX.
32. C. Chassapis, H. Hadim, S.K. Esche, R. Ubell, and F.T. Fisher (2007). "Educational underpinnings of an online undergraduate mechanical engineering degree for non-traditional learners", *2007 Engineering Education NSF Awardees Conference*, Arlington, VA, USA, September 26-28, 2007.
31. F.T. Fisher (2007). "NUE: Virtual research experiences for undergraduates in nanotechnology (VREUN)", *2007 Engineering Education NSF Grantees Conference*, September 26-28, Arlington, VA.
30. F.T. Fisher (2007). "Nanomechanics and polymer nanocomposites", *NIST Workshop on Materials Characterization for Nanoscale Reliability*, August 14-16, Boulder, CO.
29. V.R. Challa, M.G. Prasad, Y. Shi, and F.T. Fisher (2007). "Resonant frequency tunable vibration energy harvesting device", *The 6<sup>th</sup> International Workshop on Structural Health Monitoring*, September 11-13, Stanford University, Stanford, CA.
28. G. Mago, J. A. Dutreuil, F.T. Fisher, and D.M. Kalyon (2007). "Structural formation in poly(butylene terephthalate) and PBT nanocomposites during uniaxial deformation", *ASME International Mechanical Engineering Conference and Exposition (IMECE)*, November 11-15, Seattle, WA.
27. V.R. Challa, M.G. Prasad, Y. Shi, and F.T. Fisher (2007). "A wide frequency range tunable vibration energy harvesting device using magnetically induced stiffness", *ASME International Mechanical Engineering Conference and Exposition (IMECE)*, November 11-15, Seattle, WA.
26. F.T. Fisher, H. Du and S. Sukhishvili (2007). "A cross-disciplinary graduate degree concentration in nanotechnology", *2007 American Society for Engineering Education Conference*, June 24-27, Honolulu, HI.
25. F.T. Fisher, H. Hadim, S. Esche, R. Ubell, and C. Chassapis (2007). "Feasibility of a fully online undergraduate mechanical engineering degree for non-traditional learners", *2007 American Society for Engineering Education Conference*, June 24-27, Honolulu, HI.
24. G. Mago, F.T. Fisher, and D.M. Kalyon (2007). "Nanoparticle-enhanced shear-induced crystallization of semicrystalline polymer nanocomposites", *2007 Joint ASME/ASCE/SES Conference on Mechanics and Materials (McMAT2007)*, June 3-7, Austin, TX.
23. G. Mago, F.T. Fisher, and D.M. Kalyon (2006). "Effect of shearing on the crystallization behavior of poly(butylene terephthalate) and PBT nanocomposites", *ASME International Mechanical Engineering Conference and Exposition (IMECE)*, November 5-10, Chicago, IL.

22. FT Fisher and C Chassapis (2006). "Guided CAE software learning modules for the undergraduate mechanical engineering curriculum", 2006 American Society for Engineering Education Conference, June 18-21, Chicago, IL.
21. FT Fisher and KC Lee (2005). "Micromechanics modeling of the frequency-domain behavior of nanotube-reinforced polymers: Interphase effects", 2005 *ASME International Mechanical Engineering Conference and Exposition (IMECE)*, November 5-11, Orlando, FL.
20. FT Fisher, KC Lee, and LC Brinson (2005). "Viscoelastic properties of non-bulk polymer interphases in nanotube-reinforced polymers", 2005 *Society for Experimental Mechanics Annual Conference*, June 7-9, Portland, OR.
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", 18<sup>th</sup> *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", 18<sup>th</sup> *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

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**

- 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**

- Vice-Chair, American Society of Mechanical Engineering (ASME) Materials Division Polymers Technical Committee (2008-09)
- Guest Editor, Journal of Nanomaterials, Special Issue on Polymer Nanocomposite Processing, Characterization, and Applications, to be published Spring 2010
- Editorial Board, Journal of Computational and Theoretical Nanoscience
- 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, 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
- NSF Reviewer, Division of Chemical, Bioengineering, Environmental, and Transport Systems, unsolicited proposals, 2008
- NSF Review Panelist, CMMI Materials Processing and Manufacturing program, 2008
- NSF Review Panelist, Nanotechnology Undergraduate Education (NUE) program, 2006
- NSF Review Panelist, Curriculum, Course, and Laboratory Improvement (CCLI) program, 2005
- NSF Review Panelist, Division of Design, Manufacture, and Industrial Innovation (DMI), 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, Smart Materials and Structures, Sensors and Actuators A, Measurement Science and Technology, ASME/IEEE Journal of Microelectromechanical Systems, 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**

- Co-Director, Nanotechnology Graduate Program (NGP) at Stevens (Spring 2007-current)
- Co-Instructor for NANO 600 (F06, F07, F08), NANO 525 (S07, S08, S09)
- 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 Projects (OSP) (Spring 2008-current)
- The Laboratory for Multiscale Imaging (LMSI) Advisory Board (Spring 2008-current)
- Multiscale Engineering, Science and Technology Research Community presentation, Stevens Research & Entrepreneurship Day (Provost Office), April 30, 2008
- Faculty Planning Committee, Stevens Research & Entrepreneurship Day (Provost Office), April 30, 2008
- Metro Area MEMS/NEMS Workshop Co-Coordinator, July 23, 2007
- Member, School of Engineering Dean search committee (Spring 2007)
- Member, Civil Engineering faculty 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)



- Mechanical Engineering Undergraduate Curriculum Committee (Fall 2004 – current)
- Mechanical Engineering Research Committee (Spring 2007 – current)
- Mechanical Engineering Communications Committee (Spring 2007 – current)
- Mechanical Engineering, Fielding Computer Lab Coordinator (Fall 2004 – 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.
- Faculty Working Group on Nanotechnology Graduate Education (AY 2005-06)
- Office of Research Services, Focus Group representative for SoE (Spring 2006)
- Guest lecturer, Ch/MT/NANO 525 'Techniques of Surface and Nanostructure Characterization' (Spring 2008: 7 classes)
- Guest lecturer, H183 Honors Research Seminar (Fall 2005 – current)
- Guest lecturer, ME 424 Senior Design (Spring 2005 – current)
- Guest lecturer, E101/102 Engineering Experiences (Spring 2006 - current)

### **SYNERGISTIC EDUCATIONAL ACTIVITIES**

- GK12: NJ Alliance for Engineering Education (NJAE) (co-PI), NSF DGE-0742462, 01/07/08 – 12/31/12, \$2,999,962.
- NUE: Virtual research experiences for undergraduates in nanotechnology (VREUN) (PI), NSF ESI-0532555, 9/01/05-08/31/07, \$200,000.
- Stevens Scholars and Technogenesis undergraduate summer research host (4 students, Summer 2008)
- Stevens Scholars undergraduate summer research host (8 students, Summer 2008)
- Stevens Scholars undergraduate summer research host (5 students, Summer 2007)
- Stevens Scholars undergraduate summer research host (3 students, Summer 2006)
- Technogenesis Scholars undergraduate summer research host (3 students, Summer 2006)
- K12/Undergraduate students: female high school student intern in research lab (May 2005); Stevens Honors Program undergraduate student (Spring 2006)
- Faculty participant, GEAR-UP Summer Program for 7<sup>th</sup> graders (Summer 2006)
- Faculty participant, Exploring Career Options in Engineering & Science (ECOES) for high school students (2005, 2007, 2008, 2009)
- Collaborator, Center for Innovation in Engineering and Science Education (CIESE), Stevens
- Graduate coordinator of the Dean's Scholar Program for undergraduate engineering students at Northwestern University (Academic Year 2000).
- Project leader for the Illinois Science Olympiad, Nichols Middle School, Evanston, Illinois (1998, 1999).
- Participant in the Math and Science Enrichment Day at Dawes Elementary School, Evanston, Illinois (2003).

### **MAJOR SYNERGISTIC AND COLLABORATIVE RESEARCH ACTIVITIES AT STEVENS**

- Co-PI on NSF MRI (Major Research Instrumentation): Acquisition of an Inductively Coupled Plasma (ICP) Etcher for Nano/Micro Device Fabrication (co-PI, with Shi (PI), Yang, Choi, and Strauf), NSF MRI, \$190,000, 09/01/08-08/31/11
- Senior Personnel on NSF IGERT (Interdisciplinary Graduate Education and Research Training), 5 yr, \$3M pre-proposal, 'IGERT: A Challenge-Based Curriculum for Integrated, Interdisciplinary Biomedical Engineering Research and Training', submitted April 2008; A. Ritter, CCBBME, PI.
- Co-PI on NSF IGERT (Interdisciplinary Graduate Education and Research Training), 5 yr, \$3M pre-proposal, 'IGERT: H2O-Nano-based Environmental Technology Innovations (H2O-NETi) Program', submitted March 2007; C. Christodoulatos, CEOE, PI.
- Co-PI (and Co-Director) of 5 year, \$12.5M ARL CTA on Micro Autonomous Systems Technology (MAST); Center for Bioinspired Microsystem Mechanics; Stevens lead with Rutgers, NYU, and CCNY submitted November 2006. R. Besser, CBME, PI.
- Co-PI on NSF IGERT (Interdisciplinary Graduate Education and Research Training), 5 yr, \$3M pre-proposal submitted March 2006; H. Du, CBME, PI.
- Co-PI on NSF GK-12 proposal, 5 yr, \$3M pre-proposal submitted June 2005, June 2006 (Fund if Possible), June 2007 (funded); C. Chassapis, ME, PI.
- PI on NSF MRI (Major Research Instrumentation) \$300k+ grant to acquire Zyvex Nanomanipulator and related accessories for broad, inter- and multi-disciplinary use at Stevens (Jan 2005, Jan 2006 - funded)

- Faculty Working Group on Nanotechnology Graduate Education (AY 2005-2006)

## **SOCIETY AFFILIATIONS**

- American Society of Mechanical Engineers (ASME)
- Society for Experimental Mechanics (SEM)
- American Society of Engineering Education (ASEE)

## **COLLABORATORS**

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