

16th

U.S. National Congress of Theoretical and Applied Mechanics



PENNSTATE



**June 27 to July 2, 2010
State College, Pennsylvania**

USNCTAM 2010 SESSION SUMMARY

Room Name/#	Mon., June 28		Tues., June 29		Wed., June 30		Thurs., July 1		Fri., July 2	
	9:15-11:20	12:35-2:40	9:15-11:20	12:35-2:40	9:15-11:20	12:35-2:40	9:15-11:20	12:35-2:40	2:55-5:00	9:15-11:20
Deans Hall 1	MA1 4-17-1	MB1 4-17-2	MC1 4-17-3	TA1 4-17-4	TB1 4-17-5	WA1 4-23-1	RA1 3-5-1	RB1 3-5-2	RC1 3-5-3	FA1 3-5-4
Deans Hall 2	MA2 2-2-1	MB2 4-22-1	MC2 4-22-2	TA2 4-22-3	TB2 4-25-1	WA2 4-25-3	RA2 4-25-4	RB2 4-25-5	RC2 4-25-6	FA2 4-26-1
Senate 3	MA3 5-4-1	MB3 5-4-2	MC3 5-4-3	TA3 5-4-4	TB3 5-4-5	WA3 5-7-1	RA3 5-5-1	RB3 5-5-2	RC3 5-5-3	FA3 5-1-2
Senate 2	MA4 5-10-1	MB4 5-10-2	MC4 5-10-3	TA4 5-10-4	TB4 5-10-5	WA4 5-9-1	RA4 5-9-2	RB4 3-11-1	RC4 3-11-2	FA4 3-11-3
Room 104	MA104 4-9-2	MB104 4-9-3	MC104 4-9-4	TA104 4-9-5	TB104 4-11-1	WA104 4-11-3	RA104 5-1-3	RB104 5-1-4	RC104 5-3-1	FA104 5-3-2
Room 105	MA105 4-12-1	MB105 4-12-2	MC105 4-12-3	TA105 4-12-5	TB105 4-12-5	WA105 4-13-1	RA105 4-13-2	RB105 4-13-3	RC105 4-13-4	FA105 4-13-5
Room 106	MA106 4-16-1	MB106 4-16-2	MC106 4-16-3	TA106 4-6-1	TB106 4-18-1	WA106 4-18-3	RA106 4-3-1	RB106 4-3-2	RC106 4-3-3	FA106 4-3-4
Room 107	MA107 4-32-1	MB107 4-32-2				WA107 4-28-1	RA107 4-28-2	RB107 4-29-1	RC107 4-29-2	FA107 4-29-3
Room 108	MA108 4-7-4	MB108 4-7-5	MC108 4-7-6	TA108 4-7-7	TB108 4-7-1	WA108 4-7-3	RA108 4-31-1	RB108 4-31-2	RC108 4-31-3	FA108 4-15-1
Room 109	MA109 4-24-1	MB109 4-24-2	MC109 4-24-3	TA109 4-19-1	TB109 4-19-2	WA109 4-1-1	RA109 4-1-2	RB109 4-1-3	RC109 4-1-4	FA109 4-1-5
Room 112	MA112 1-1-1	MB112 1-1-2	MC112 1-4-1	TA112 1-4-2	TB112 1-4-3	WA112 1-5-1	RA112 1-5-2	RB112 1-5-3	RC112 1-5-4	FA112 3-1-1
Room 203	MA203 1-2-1	MB203 1-2-2	MC203 1-2-3	TA203 1-2-4	TB203 1-2-5	WA203 1-3-3	RA203 1-3-4	RB203 1-3-5	RC203 2-7-1	FA203 2-7-2
Room 205	MA205 2-3-1	MB205 2-3-1	MC205 2-3-3	TA205 2-3-4	TB205 2-3-5	WA205 2-13-3	RA205 2-13-2	RB205 2-13-1	RC205 2-13-4	FA205 2-13-5
Room 206	MA206 3-2-1	MB206 3-2-2	MC206 3-2-3	TA206 3-2-4	TB206 3-2-5	WA206 3-9-1	RA206 3-9-3	RB206 3-9-4	RC206 3-9-5	FA206 3-9-6
Room 207	MA207 4-14-1	MB207 4-14-2	MC207 4-4-1	TA207 4-4-2	TB207 4-4-3	WA207 4-4-5	RA207 4-4-6	RB207 4-4-7	RC207 4-4-8	FA207 4-4-9
Room 208	MA208 3-10-1	MB208 3-6-1	MC208 3-6-2	TA208 3-6-3	TB208 3-6-4	WA208 3-6-6	RA208 3-6-7	RB208 3-6-8	RC208 3-6-9	FA208 3-6-10
Room 211	MA211 2-5-1	MB211 2-5-2	MC211 2-4-1	TA211 2-4-2	TB211 2-1-1	WA211 3-3-1	RA211 3-3-2	RB211 4-8-1	RC211 4-8-2	FA211 4-8-3
Room 218	MA218 4-2-1	MB218 4-2-2	MC218 4-2-3	TA218 4-2-4	TB218 4-30-1	WA218 4-30-3	RA218 4-21-1	RB218 4-21-2	RC218 4-20-1	FA218 4-20-2
Room 219	MA219 2-6-1	MB219 2-6-2	MC219 2-6-3	TA219 2-6-4	TB219 2-6-5	WA219 2-9-2	RA219 2-9-3	RB219 2-9-4	RC219 2-11-1	FA219 2-11-2

Plenary Sessions are Monday, Tuesday, Wednesday, and Thursday in Presidents Hall 1-4 from 8:00 a.m. to 8:50 a.m.

Session Name Code

Sessions are named by a code consisting of two letters and a number.

First letter refers to the day of the session
M: Monday, June 28
T: Tuesday, June 29
W: Wednesday, June 30

Second letter refers to time of the session
A: First Concurrent Session (9:15 a.m. to 11:20 a.m.)
B: Second Concurrent Session (12:35 p.m. to 2:40 p.m.)
C: Third Concurrent Session (2:55 p.m. to 5:00 p.m.)

Session MA2

The number refers to the location of the session

- 1: Deans Hall 1 105: Room 105 112: Room 112 208: Room 208
- 2: Deans Hall 2 106: Room 106 203: Room 203 211: Room 211
- 3: Senate Suite 3 107: Room 107 205: Room 205 218: Room 218
- 4: Senate Suite 2 108: Room 108 206: Room 206 219: Room 219
- 104: Room 104 109: Room 109 207: Room 207

WELCOME TO THE 16TH USNCTAM

The US National Committee on Theoretical and Applied Mechanics is sponsoring the 16th US National Congress of Theoretical and Applied Mechanics (USNCTAM) from June 27 to July 2, 2010 at the Penn Stater Conference Center Hotel in State College, PA. The Congress, held every four years, is the premier American forum for networking and technical information exchange for researchers and students interested in mechanics. The Congress agenda consists of a welcome reception, four plenary presentations, 19 parallel technical sessions, lunches, and a banquet. Technical sessions cover recent developments in materials and structures, fluid mechanics, dynamics, biomechanics, and computational mechanics. Approximately 900 papers by colleagues are scheduled. Technical sessions on Monday, Tuesday, and Thursday will be held all day. On Wednesday and Friday technical sessions will be held in the morning only, allowing attendees some time to enjoy the State College area.

The local organizers have arranged several interesting tour opportunities for accompanying guests. Monday afternoon features a tour to Penn’s Cave—America’s only all-water cavern—including a wildlife viewing park. Tuesday features an all-day trip to Gettysburg National Military Park for a guided tour of the historic battlefield, museum, and Cyclorama. Wednesday morning features a trip to the Amish country market in nearby Belleville to participate in an Amish open air market featuring produce, antiques, household items, and baked goods.

On behalf of the US National Committee on Theoretical and Applied Mechanics, the Organizing Committee extends a warm welcome to all mechanics researchers to the picturesque ridge-valley region of Central Pennsylvania. We hope you have a stimulating and enjoyable experience at the 16th USNCTAM.



Judith A. Todd
Congress Chair



Charles E. Bakis
Technical Program Chair



Stelios Kyriakides
Scientific Committee Chair

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CONGRESS INFORMATION

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Zhigang Suo, Harvard University

Nicolas Triantafyllidis, University of Michigan

Fluids

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Charbel Farhat, Stanford University

Fazle Hussain, University of Houston

Sangtae Kim, Purdue University

William S. Saric, Texas A & M University

Alexander Smits, Princeton University

Howard A. Stone, Princeton University

Biomechanics

Gang Bao, Georgia Institute of Technology

Iwona Jasiuk, University of Illinois at Urbana-Champaign

Winston Soboyejo, Princeton University

Subra Suresh, Massachusetts Institute of Technology

Dynamics

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- Air Force Office of Scientific Research
- Army Research Office/Army Research Laboratory
- National Science Foundation
- Office of Naval Research

US National Committee on Theoretical and Applied Mechanics 2009–2010

The U.S. National Committee on Theoretical and Applied Mechanics (USNC/TAM) represents the interests of the United States in international scientific activities relating to the field of mechanics, specifically to the International Union of Theoretical and Applied Mechanics (IUTAM). The committee is the focal point for the U.S. engineering, scientific, and mathematical communities working in mechanics and serves as the national forum for defining major issues in mechanics research, technology, and education.

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SOCIAL PROGRAMS/TOURS

Banquet Information

The congress banquet will be held Wednesday evening at 7 p.m. in the President's Hall. A pre-banquet reception with cash bar will begin at 6:30 p.m. in the President's Hall Pre-function Area immediately outside of the President's Hall. A ticket (included with full registration) is required for entrance to the banquet. Guest tickets may be purchased at the reception desk.

Receptions

Meet and Greet

Sunday, June 27, 4:00 – 6:00 p.m.

An early-bird, meet and greet reception with a cash bar will be held on Sunday evening from on the West Terrace. This event is open to all conference attendees and their guests.

Conference-Wide Reception

Monday, June 28, 5:30 – 7:00 p.m.

All conference registrants and their registered guests are invited to attend the conference-wide reception on Monday in the Courtyard near Presidents Hall 1-4. Meet new and old friends and renew acquaintances while enjoying a relaxing evening with a variety of appetizers and cash bar.

Guest Meals

Guest luncheon tickets may be purchased at the registration desk for \$25.

Tour Information

The USNCTAM conference organizers have arranged tour opportunities for accompanying persons.

Penn's Cave (cavern/wildlife) Trip and Tour

Monday, June 28 (\$30 per person)

This afternoon tour will feature a trip to nearby Penn's Cave, America's only all-water cavern, plus viewing a wildlife park. The tour will include a one-hour tour of the cave by boat, plus a ninety-minute motorized tour of 1,500 acres of Penn's Cave forests and fields which have been carefully preserved as a natural habitat for birds, plants, and animals.

Gettysburg Trip and Tour

Tuesday, June 29 (\$50 per person)

This all-day trip will include travel to the Gettysburg National Military Park, viewing the Cyclorama (oil paintings explaining the Battle of Gettysburg), guided tour of the battlefield, and visit to the museum.

Belleville/Amish Country Market

Wednesday, June 30 (\$30 per person)

This morning trip to nearby Belleville, Pennsylvania, will provide the opportunity to participate in an Amish open air market featuring produce, antiques, household items, and baked goods.

OVERVIEW OF MEETING

All event locations are in the Penn State Conference Center Hotel unless otherwise designated.

Sunday, June 27, 2010

- 3:00 p.m. – 6:00 p.m. Registration, Registration Desk 1
7:30 a.m. – 5:00 p.m. US National Committee on Theoretical and Applied Mechanics Meeting (by invitation only), Senate Suites
4:00 p.m. – 6:00 p.m. Reception, West Terrace/Deans Hall 1-2

Monday, June 28, 2010

- 7:00 a.m. – 3:00 p.m. Registration, Registration Desk 1
8:00 a.m. – 8:50 a.m. Plenary Lecture: Charbel Farhat, Presidents Hall 1-4
8:00 a.m. – 11:45 a.m. ASME Applied Mechanics Division Executive Committee (members only), Room 114, Materials Research Institute Building
8:50 a.m. – 9:15 a.m. Break
9:15 a.m. – 11:20 a.m. Technical Sessions MA1–MA219
11:20 a.m. – 12:35 a.m. Lunch, Presidents Hall 1-4
12:35 p.m. – 2:40 p.m. Technical Sessions MB1–MB219
2:40 p.m. – 2:55 p.m. Break
2:55 p.m. – 5:00 p.m. Technical Sessions MC1–MC219
5:30 p.m. – 7:00 p.m. Reception, Courtyard/Presidents Hall 1-4

Tuesday, June 29, 2010

- 7:00 a.m. – 3:00 p.m. Registration, Registration Desk 1
8:00 a.m. – 8:50 a.m. Plenary Lecture: Zhigang Suo, Presidents Hall 1-4
8:50 a.m. – 9:15 a.m. Break
9:15 a.m. – 11:20 a.m. Technical Sessions TA1–TA219
11:20 a.m. – 12:35 a.m. Lunch, Presidents Hall 1-4
12:35 p.m. – 2:40 p.m. Technical Sessions TB1–TB219
2:40 p.m. – 2:55 p.m. Break
2:55 p.m. – 5:00 p.m. Technical Sessions TC1–TC219
6:00 p.m. – 7:30 p.m. Penn State Engineering Science and Mechanics Alumni Reception (alumni and friends only), Presidents Hall 1

Wednesday, June 30, 2010

- 7:00 a.m. – noon Registration, Registration Desk 1
8:00 a.m. – 8:50 a.m. Plenary Lecture: Pol Spanos, Presidents Hall 1-4
8:50 a.m. – 9:15 a.m. Break
9:15 a.m. – 11:20 a.m. Technical Sessions WA1–WA219
11:20 a.m. – 12:35 a.m. Lunch, Presidents Hall 1-4
6:30 p.m. – 7:00 p.m. Pre-Banquet Reception, Presidents Hall Pre-function Area
7:00 p.m. – 9:00 p.m. Banquet with wine service, Presidents Hall 1-4

Thursday, July 1, 2010

- 7:00 a.m. – 3:00 p.m. Registration, Registration Desk 1
8:00 a.m. – 8:50 a.m. Plenary Lecture: Mory Gharib, Presidents Hall 1-4
8:50 a.m. – 9:15 a.m. Break
9:15 a.m. – 11:20 a.m. Technical Sessions RA1–RA219
11:20 a.m. – 12:35 a.m. Lunch, Presidents Hall 1-4
12:35 p.m. – 2:40 p.m. Technical Sessions RB1–RB219
2:40 p.m. – 2:55 p.m. Break
2:55 p.m. – 5:00 p.m. Technical Sessions RC1–RC219

Friday, July 2, 2010

- 7:00 a.m. – noon Registration, Registration Desk 1
8:50 a.m. – 9:15 a.m. Break
9:15 a.m. – 11:20 a.m. Technical Sessions FA1–FA219
11:20 a.m. – 12:35 a.m. Lunch, Presidents Hall 1-4

PLENARY LECTURES

Monday, June 28

8:00 – 8:50 a.m., Presidents Hall 1-4

A Computational Framework for Modeling Highly Nonlinear Multi-Phase Fluid-Structure Interaction Problems



Charbel Farhat

Vivian Church Hoff Professor of Aircraft Structures
Chairman, Department of Aeronautics and Astronautics
Professor of Mechanical Engineering
Stanford University, Stanford, California

The implosive collapse of a submerged, gas-filled structure and its subsequent effect on the structural integrity of a nearby system is a transient, high-speed, multi-phase fluid-structure interaction problem characterized by ultrahigh compressions, shock waves, large structural displacements and deformations, self-contact, and possibly the initiation and propagation of cracks in the structure. It is a major area of concern in many underwater engineering applications. This problem is also relevant to other applications such as the extracorporeal shock wave lithotripsy procedure where shock waves are generated to break a kidney stone into small pieces that can travel more easily through the urinary tract and pass from the body.

Tuesday, June 29

8:00 – 8:50 a.m., Presidents Hall 1-4

Mechanics and Materials for Soft Machines



Zhigang Suo

Allen E. and Marilyn M. Puckett Professor
of Mechanics and Materials

Harvard University, Cambridge, Massachusetts

The convergence of parts of biology and engineering has created exciting opportunities for discoveries, inventions, and commercialization. The overarching themes include using engineering tools to study biology, combining biology and engineering to invent medical procedures, and mimicking biology to create engineering devices. In this talk, Dr. Suo will describe recent work in his group on the mechanics of soft active materials. They formulate theories to answer commonly asked questions. How do mechanics, chemistry, and electricity work together to generate large deformation? What is the maximal energy that can be converted by a soft material? How do molecular processes affect material response? How can the theories be implemented in commercial software and make the theories useful to other researchers? The theories are illustrated with phenomena arising in applications, drawing on recently reported experimental observations, and focusing on large deformation and instability.

Wednesday, June 30

8:00 – 8:50 a.m., Presidents Hall 1-4

Joint Time-Frequency Analysis in Structural Dynamics Applications



Pol Spanos

L. B. Ryon Endowed Chair in Engineering
Rice University, Houston, Texas

Traditional Fourier analysis has been an important tool in engineering applications for many years. However, it does not capture readily non-stationary and local features, which are inherently present in many structural dynamics problems. The lecture will focus on modern time-frequency analysis techniques for capturing localized effects and evolutionary frequency content by using wavelets, chirplets, and signal intrinsic modes. These techniques will be presented in context with earthquake engineering applications and they will be used for analyzing both historic ground accelerograms and linear/nonlinear seismic responses of benchmark systems. However, they are applicable as well to a plethora of other structural engineering, and engineering mechanics in general, themes. A perspective on pitfalls of stochastic decision making will also be discussed.

Thursday, July 1

8:00 – 8:50 a.m., Presidents Hall 1-4

Lessons for Bio-Inspired Design: Morpho-Dynamics of Embryonic Heart



Mory Gharib

Hans W. Liepmann Professor of Aeronautics
**California Institute of Technology,
Pasadena, California**

Nature has shown us that some hearts do not require valves to achieve unidirectional flow. In its earliest stages, the vertebrate heart consists of a primitive tube that drives blood through a simple vascular network nourishing tissues and other developing organ systems. Traditional developmental dogma states that valveless, unidirectional pumping in biological systems occurs by peristalsis. However, our *in vivo* studies of embryonic Zebrafish heart where we mapped the movement of both the myocardial cells in the developing heart tube wall as well as the flow of blood through the tube contradicts the notion of peristalsis as a pumping mechanism in the valveless embryonic heart. Instead, we have discovered an intriguing wave reflection process based on impedance mismatches at the boundaries of the heart tube. From these observations we have developed a physio-mathematical model that proposes an elastic wave resonance mechanism of the heart tube as the more likely pumping mechanism. In this model fewer cells are required to actively contract in order to maintain the pumping action than are necessary in a peristaltic mechanism.

SYMPOSIA TOPICS

Symposium Title	Session Name	Organizers
Computational Methods		
1-1 General	MA112, MB112	S. Zhang
1-2 Computational Modeling of Multi-Scale/Multi-Physics Processes in Materials	MA203, MB203, MC203, TA203, TB203	W. K. Liu, F. Vernerey, E. Karpov
1-3 Numerical and Analytical Methods in Mechanics of Solids	TC203, WA203, RA203, RB203	E. S. Ventsel
1-4 Isogeometric Analysis	MC112, TA112, TB112, TC112	Y. Zhang, Y. Bazilevs
1-5 Theoretical and Computational Methods for Critical Material Behavior: Fracture, Dislocation, and Phase Transformation	WA112, RA112, RB112, RC112	M. Parks, Y. Chen, X. Li, S. A. Silling
Fluid Mechanics		
2-1 General	TB211, TC109	J. Brasseur
2-2 Non-Classical Turbulence Physics	MA2, TC211	J. Brasseur
2-3 High Reynolds Number Turbulence	MB205, MC205, TA205, TB205, TC205	A. Smits
2-4 Cellular-Scale Hydrodynamics	MC211, TA211	H. A. Stone, J. Wan
2-5 Free-Surface Flows	MA211, MB211	H. Stone, A. Belmonte
2-6 Transport in Microscale and Laminar Flows	MA219, MB219, MC219, TA219, TB219	N. Aubry, M. Stremler
2-7 Fluid Mechanics at the Nanoscale	RC203, FA203	I. K. Puri
2-9 Mechanics of Locomotion in Fluids	TC219, WA219, RA219, RB219	S. Alben
2-11 Non-Newtonian Flows	RC219, FA219	P. Singh, A. J. Kadaksham
2-13 Respiratory Fluid Mechanics	WA205, RA205, RB205, RC205, FA205	J. B. Grotberg
Biomechanics		
3-1 General	FA112	C. Bakis
3-2 Mechanics of Biological and Bioinspired Materials	MA206, MB206, MC206, TA206, TB206	I. Jasiuk
3-3 Nonlinear Modeling of Muscle and Soft Tissue	WA211, RA211	J. Brasseur, F. Costanzo
3-5 Mechanics and Biology	RA1, RB1, RC1, FA1	S. Cowin
3-6 Molecular and Cellular Biomechanics: Adhesion, Cell-ECM Interaction, and Mechanotransduction	MB208, MC208, TA208, TB208, TC208, WA208, RA208, RB208, RC208, FA208	S. Zhang, G. Bao, H. Gao, K. J. Hsia, J. Li, K. Grosh
3-9 Biological Materials and Constituents from Nano to Macro	TC206, WA206, RA206, RB206, RC206, FA206	M. J. Buehler, L. Dorfmann
3-10 TMJ Biomechanics	MA208	M. Detamore, A. Almarza

Symposium Title	Session Name	Organizers
3-11 Mechanics of Traumatic Brain Injury	RB4, RC4, FA4	L. Gu, N. Chandra
<i>Mechanics of Materials and Structures</i>		
4-1 General	WA109, RA109, RB109, RC109, FA109	C. Bakis
4-2 Dynamic Response of Materials	MA218, MB218, MC218, TA218	K. Ravi-Chandar, G. Subhash, P. H. Geubelle
4-3 Multi-Physics of Nanoscale Materials and Interfaces	RA106, RB106, RC106, FA106	A. Haque, V. Prakash
4-4 Mechanics of Crystalline Nanostructures	MC207, TA207, TB207, TC207, WA207, RA207, RB207, RC207, FA207	H. Park, H. D. Espinosa
4-5 Mechanics of Materials and Structures for Extreme Environments	TC1	V. Prakash
4-6 Transforming Visualization of Microstructure into Simulation for Multi-Scale Mechanics	TA106	O. Ochoa, D. Mollenhauer
4-7 Structural Health Monitoring	MA108, MB108, MC108, TA108, TB108, TC108, WA108	C. Lissenden, D. E. Adams
4-8 Damage Mechanics of Solids and Structures	RB211, RC211, FA211	R. K. Abu Al-Rub
4-9 Non-Local and Strain Gradient Elasticity, Viscoelasticity, and Plasticity	MA104, MB104, MC104, TA104	R. K. Abu Al-Rub, X.-L. Gao
4-11 Damage and Failure of Composite Materials	TB104, TC104, WA104	R. Talreja
4-12 Mechanics of Low-Dimensional Carbon Materials	MA105, MB105, MC105, TB105	S. Zhang, V. Shenoy, J. Huang, A. To
4-13 Structures and Devices with Multifunctional or Smart Materials: Design and Analysis	WA105, RA105, RB105, RC105, FA105	A. Srinivasa, S. M. Srinivasan
4-14 Electromechanics of Ionic Polymer Metal Composites (IPMCs)	MA207, MB207	M. Shahinpoor, K. J. Kim
4-15 Thermoelasticity, Thermal Stresses, and Thermal Shock	FA108	A. E. Segall, R. K. Akarapu
4-16 Macroscopic Properties and Instabilities in Heterogeneous Materials Systems	MA106, MB106, MC106	O. Lopez-Pamies, P. Ponte Castaneda
4-17 Instability of Solids and Structures	MA1, MB1, MC1, TA1, TB1	S. Kyriakides, T. Healey, N. Triantafyllidis
4-18 Mechanics of Random and Fractal Materials	TB106, TC106, WA106	M. Ostojca-Starzewski
4-19 Constitutive Modeling of Particulate Material Behavior	TA109, TB109	A. Palomino
4-20 Mechanics of Advanced Infrastructure Materials	RC218, FA218	J. F. Davalos, A. Chen
4-21 Mechanics of Dissimilar Materials Interfaces	RA218, RB218	J. F. Davalos, A. Chen
4-22 Mechanics of Energy Storage	MB2, MC2, TA2	R. McMeeking, M. Kamlah, P. Sofronis
4-23 Multi-Scale Modeling and Response of Nano-Structures	WA1	E. Mockensturm
4-24 Multiscale Modeling of Progressive Failure in Fiber Reinforced Composites	MA109, MB109, MC109	A. Waas, B. Bednarzyk, S. Arnold

Symposium Title	Session Name	Organizers
4-25 Symposium Honoring Professor Robert M. McMeeking on the Occasion of His 60th Birthday	TB2, TC2, WA2, RA2, RB2, RC2	C. M. Landis, M. R. Begley
4-26 Experimental Fracture Mechanics	FA2	C. Bakis
4-28 Measurement and Modeling of High-Strain-Rate Deformation	WA107, RA107	I. Smid, J. Gabrys
4-29 Solid Mechanics as a Framework for Modeling New Phenomena	RB107, RC107, FA107	A. Wineman, T. Pence
4-30 Multiscale Mechanical Characterization and Modeling of Porous Materials	TB218, TC218, WA218	J. Andrade, H. M. Jennings
4-31 Cyclic Plasticity of Materials: Experimentation and Constitutive Modeling at the Micro and Macroscopic Levels	RA108, RB108, RC108	T. Hassan, C. Lissenden
4-32 Thermal Transport Phenomena in Heterogeneous Materials and Their Interfaces	MA107, MB107	A. Roy, T. Fisher
Dynamics		
5-1 General	TC3, RA104, RB104, FA3	J. Cusumano
5-3 Recent Advances in Nonlinear Dynamics	RC104, FA104	T. Peacock, C. Rowley
5-4 Nonlinear Phenomena in Mechanical and Structural Systems	MA3, MB3, MC3, TA3, TB3	A. J. Dick, B. Balachandran
5-5 Dynamical Data Analysis of Multiscale Systems	RA3, RB3, RC3	D. Chelidze, J. Cusumano
5-7 Nonlinear Dynamics in Physiology and Medicine	WA3	X. Zhao, W. Ying, Q. Lu
5-9 Computational Methods for Dynamical Systems Analysis	WA4, RA4	H. Dankowicz, M. West
5-10 Dynamics and Stability of Human Movement Systems	MA4, MB4, MC4, TA4, TB4, TC4	M. Tanaka, J. Dingwell

SESSION SCHEDULE BY TOPIC

Computational Methods

1-1 General

- MA112 1-1-1 Extended Finite Element Formulations: Monday, 9:15 a.m. – 11:20 a.m.
MB112 1-1-2 Computational Methods for Dynamic Problems: Monday, 12:35 p.m. – 2:40 p.m.

1-2 Computational Modeling of Multi-Scale/Multi-Physics Processes in Materials

- MA203 1-2-1 Multiscale Dynamical Characterization: Monday, 9:15 a.m. – 11:20 a.m., Room 203
MB203 1-2-2 Multiphase and Atomistic-to-Continuum Coupling Methods: Monday, 12:35 p.m. – 2:40 p.m., Room 203
MC203 1-2-3 Advanced Material Systems and Nondeterministic Methods: Monday, 2:55 p.m. – 5:00 p.m., Room 203
TA203 1-2-4 Electronic Effects and Quantum Systems: Tuesday, 9:15 a.m. – 11:20 a.m., Room 203
TB203 1-2-5 Advanced Systems and Processes: Tuesday, 12:35 p.m. – 2:40 p.m., Room 203

1-3 Numerical and Analytical Methods in Mechanics of Solids

- TC203 1-3-2 Numerical and Analytical Methods in Mechanics of Solids—I: Tuesday, 2:55 p.m. – 5:00 p.m., Room 203
WA203 1-3-3 Numerical and Analytical Methods in Mechanics of Solids—II: Wednesday, 9:15 a.m. – 11:20 a.m., Room 203
RA203 1-3-4 Numerical and Analytical Methods in Mechanics of Solids—III: Thursday, 9:15 a.m. – 11:20 a.m., Room 203
RB203 1-3-5 Numerical and Analytical Methods in Mechanics of Solids—IV: Thursday, 12:35 p.m. – 2:40 p.m., Room 203

1-4 Isogeometric Analysis

- MC112 1-4-1 Isogeometric Analysis—I: Monday, 2:55 p.m. – 5:00 p.m., Room 112
TA112 1-4-2 Isogeometric Analysis—II: Tuesday, 9:15 a.m. – 11:20 a.m., Room 112
TB112 1-4-3 Isogeometric Analysis—III: Tuesday, 12:35 p.m. – 2:40 p.m., Room 112
TC112 1-4-4 Isogeometric Analysis—IV: 2:55 p.m. – 5:00 p.m., Room 112

1-5 Theoretical and Computational Methods for Critical Material Behavior: Fracture, Dislocation, and Phase Transformation

- WA112 1-5-1 Theoretical and Computational Methods for Critical Material Behavior—I: Wednesday, 9:15 a.m. – 11:20 a.m., Room 112
RA112 1-5-2 Theoretical and Computational Methods for Critical Material Behavior—II: Thursday, 9:15 a.m. – 11:20 a.m., Room 112
RB112 1-5-3 Theoretical and Computational Methods for Critical Material Behavior—III: Thursday, 12:35 p.m. – 2:40 p.m., Room 112
RC112 1-5-4 Theoretical and Computational Methods for Critical Material Behavior—IV: Thursday, 2:55 p.m. – 5:00 p.m., Room 112

Fluid Mechanics

2-1 General

- TB211 2-1-1 General Fluid Mechanics—I: Tuesday, 12:35 p.m. – 2:40 p.m., Room 211
TC109 2-1-2 General Fluid Mechanics—II: Tuesday, 2:55 p.m. – 5:00 p.m., Room 109

2-2 Non-Classical Turbulence Physics

- MA2 2-2-1 Non-Classical Turbulence Physics—I: Monday, 9:15 a.m. – 11:20 a.m., Deans Hall 2
TC211 2-2-2 Non-Classical Turbulence Physics—II: Tuesday, 2:55 p.m. – 5:00 p.m., Room 211

2-3 High Reynolds Number Turbulence

- MB205 2-3-1 Wall-Bounded Turbulence with Roughness and Other Perturbations: Monday, 12:35 p.m. – 2:40 p.m., Room 205
MC205 2-3-3 Atmospheric Turbulent Flows: Monday, 2:55 p.m. – 5:00 p.m., Room 205
TA205 2-3-4 Turbulence Theory: Tuesday, 9:15 a.m. – 11:20 a.m., Room 205
TB205 2-3-5 Wall-Bounded Turbulent Flows: Tuesday, 12:35 p.m. – 2:40 p.m., Room 205
TC205 2-3-6 Free Shear Flows and Transition: Tuesday, 2:55 p.m. – 5:00 p.m., Room 205

2-4 Cellular-Scale Hydrodynamics

- MC211 2-4-1 Cellular-Scale Hydrodynamics—I: Monday, 2:55 p.m. – 5:00 p.m., Room 211
TA211 2-4-2 Cellular-Scale Hydrodynamics—II: Tuesday, 9:15 a.m. – 11:20 a.m., Room 211

2-5 Free-Surface Flows

- MA211 2-5-1 Free-Surface Flows—I: Monday, 9:15 a.m. – 11:20 a.m., Room 211
MB211 2-5-2 Free-Surface Flows—II: Monday, 12:35 p.m. – 2:40 p.m., Room 211

2-6 Transport in Microscale and Laminar Flows

- MA219 2-6-1 Transport in Microscale and Laminar Flows—I: Monday, 9:15 a.m. – 11:20 a.m., Room 219
MB219 2-6-2 Transport in Microscale and Laminar Flows—II: Monday, 12:35 p.m. – 2:40 p.m., Room 219
MC219 2-6-3 Transport in Microscale and Laminar Flows—III: Monday, 2:55 p.m. – 5:00 p.m., Room 219
TA219 2-6-4 Transport in Microscale and Laminar Flows—IV: Tuesday, 9:15 a.m. – 11:20 a.m., Room 219
TB219 2-6-5 Transport in Microscale and Laminar Flows—V: Tuesday, 12:35 p.m. – 2:40 p.m., Room 219

2-7 Fluid Mechanics at the Nanoscale

- RC203 2-7-1 Fluid Mechanics at the Nanoscale—I: Thursday, 2:55 p.m. – 5:00 p.m., Room 203
FA203 2-7-2 Fluid Mechanics at the Nanoscale—II: Friday, 9:15 a.m. – 11:20 a.m., Room 203

2-9 Mechanics of Locomotion in Fluids

- TC219 2-9-1 Microorganisms—I: Tuesday, 2:55 p.m. – 5:00 p.m., Room 219
WA219 2-9-2 Microorganisms—II: Wednesday, 9:15 a.m. – 11:20 a.m., Room 219
RA219 2-9-3 Macroorganisms: Flight: Thursday, 9:15 a.m. – 11:20 a.m., Room 219
RB219 2-9-4 Macroorganisms: Swimming: Thursday, 12:35 p.m. – 2:40 p.m., Room 219

2-11 Non-Newtonian Flows

- RC219 2-11-1 Non-Newtonian Flows—I: Thursday, 2:55 p.m. – 5:00 p.m., Room 219
FA219 2-11-2 Non-Newtonian Flows—II: Friday, 9:15 a.m. – 11:20 a.m., Room 219

2-13 Respiratory Fluid Mechanics

- WA205 2-13-3 Airway Closure and Reopening—I: Wednesday, 9:15 a.m. – 11:20 a.m., Room 205
RA205 2-13-2 Respiratory Particle Dynamics and Deposition: Thursday, 9:15 a.m. – 11:20 a.m., Room 205
RB205 2-13-1 Upper Airway Flow and Transport: Thursday, 12:35 p.m. – 2:40 p.m., Room 205
RC205 2-13-4 Airway Closure and Reopening—II: Thursday, 2:55 p.m. – 5:00 p.m., Room 205
FA205 2-13-5 Respiratory Transport and Structure Interactions: Friday, 9:15 a.m. – 11:20 a.m., Room 205

Biomechanics

3-1 General

- FA112 3-1-1 Biomechanics—General: Friday, 9:15 a.m. – 11:20 a.m., Room 112

3-2 Mechanics of Biological and Bioinspired

Materials

- MA206 3-2-1 Experimental Bone Mechanics: Monday, 9:15 a.m. – 11:20 a.m., Room 206
MB206 3-2-2 Modeling of Bone: Monday, 12:35 p.m. – 2:40 p.m., Room 206
MC206 3-2-3 Characterization and Modeling of Biological Materials: Monday, 2:55 p.m. – 5:00 p.m., Room 206
TA206 3-2-4 Molecular Models of Biological Systems: Tuesday, 9:15 a.m. – 11:20 a.m., Room 206
TB206 3-2-5 Bioinspired Materials: Tuesday, 12:35 p.m. – 2:40 p.m., Room 206

3-3 Nonlinear Modeling of Muscle and Soft Tissue

- WA211 3-3-1 Nonlinear Modeling of Muscle and Soft Tissue—I: Wednesday, 9:15 a.m. – 11:20 a.m., Room 211
RA211 3-3-2 Nonlinear Modeling of Muscle and Soft Tissue—II: Thursday, 9:15 a.m. – 11:20 a.m., Room 211

3-5 Mechanics and Biology

- RA1 3-5-1 Cell and Protein Mechanics: Thursday, 9:15 a.m. – 11:20 a.m., Deans Hall 1
RB1 3-5-2 Constitutive Models of Tissues: Thursday, 12:35 p.m. – 2:40 p.m., Deans Hall 1
RC1 3-5-3 Constitutive Models for Development, Growth and Remodeling: Thursday, 2:55 p.m. – 5:00 p.m., Deans Hall 1
FA1 3-5-4 Fluid and Solid Interaction in Tissue: Friday, 9:15 a.m. – 11:20 a.m., Deans Hall 1

3-6 Molecular and Cellular Biomechanics:

Adhesion, Cell-ECM Interaction, and Mechanotransduction

- MB208 3-6-1 Protein Mechanics: Monday, 12:35 p.m. – 2:40 p.m., Room 208
MC208 3-6-2 Cytoskeletal Mechanics: Monday, 2:55 p.m. – 5:00 p.m., Room 208
TA208 3-6-3 Single-Cell Mechanics: Tuesday, 9:15 a.m. – 11:20 a.m., Room 208
TB208 3-6-4 Cell-ECM Interactions: Tuesday, 12:35 p.m. – 2:40 p.m., Room 208
TC208 3-6-5 Cell Adhesion: Tuesday, 2:55 p.m. – 5:00 p.m., Room 208
WA208 3-6-6 Metastasis: Wednesday, 9:15 a.m. – 11:20 a.m., Room 208
RA208 3-6-7 Molecular Biomechanics: Thursday, 9:15 a.m. – 11:20 a.m., Room 208

- RB208 3-6-8 Membrane Mechanics: Thursday, 12:35 p.m. – 2:40 p.m., Room 208
 RC208 3-6-9 Hair Bundle Mechanotransduction: Thursday, 2:55 p.m. – 5:00 p.m., Room 208
 FA208 3-6-10 Cell Membrane Transduction and Sensing: Friday, 9:15 a.m. – 11:20 a.m., Room 208

3-9 Biological Materials and Constituents from Nano to Macro

- TC206 3-9-1 Nano to Macro—I: Tuesday, 2:55 p.m. – 5:00 p.m., Room 206
 WA206 3-9-2 Nano to Macro—II: Wednesday, 9:15 a.m. – 11:20 a.m., Room 206
 RA206 3-9-3 Nano to Macro—III: Thursday, 9:15 a.m. – 11:20 a.m., Room 206
 RB206 3-9-4 Nano to Macro—IV: Thursday, 12:35 p.m. – 2:40 p.m., Room 206
 RC206 3-9-5 Nano to Macro—V: Thursday, 2:55 p.m. – 5:00 p.m., Room 206
 FA206 3-9-6 Nano to Macro—VI: Friday, 9:15 a.m. – 11:20 a.m., Room 206

3-10 TMJ Biomechanics

- MA208 3-10-1 Biomechanics of the Temporomandibular Joint: Monday, 9:15 a.m. – 11:20 a.m., Room 208

3-11 Mechanics of Traumatic Brain Injury

- RB4 3-11-1 Traumatic Brain Injury—I: Thursday, 12:35 p.m. – 2:40 p.m., Senate 2
 RC4 3-11-2 Traumatic Brain Injury—II: Thursday, 2:55 p.m. – 5:00 p.m., Senate 2
 FA4 3-11-3 Traumatic Brain Injury—III: Thursday, 9:15 a.m. – 11:20 a.m., Senate 2

Mechanics of Materials and Structures

4-1 General

- WA109 4-1-1 Mechanics of Materials & Structures—I: Wednesday, 9:15 a.m. – 11:20 a.m., Room 109
 RA109 4-1-2 Mechanics of Materials & Structures—II: Thursday, 9:15 a.m. – 11:20 a.m., Room 109
 RB109 4-1-3 Mechanics of Materials & Structures—III: Thursday, 12:35 p.m. – 2:40 p.m., Room 109
 RC109 4-1-4 Mechanics of Materials & Structures—IV: Thursday, 2:55 p.m. – 5:00 p.m., Room 109
 FA109 4-1-5 Mechanics of Materials & Structures—V: Friday, 9:15 a.m. – 11:20 a.m., Room 109

4-2 Dynamic Response of Materials

- MA218 4-2-1 Dynamic Response of Materials—I: Monday, 9:15 a.m. – 11:20 a.m., Room 218
 MB218 4-2-2 Dynamic Response of Materials—II: Monday, 12:35 p.m. – 2:40 p.m., Room 218

- MC218 4-2-3 Dynamic Response of Materials—III: Monday, 2:55 p.m. – 5:00 p.m., Room 218
 TA218 4-2-4 Dynamic Response of Materials—IV: Tuesday, 9:15 a.m. – 11:20 a.m., Room 218

4-3 Multi-Physics of Nanoscale Materials and Interfaces

- RA106 4-3-1 Multiphysics of Materials & Interfaces—I: Thursday, 9:15 a.m. – 11:20 a.m., Room 106
 RB106 4-3-2 Multiphysics of Materials & Interfaces—II: Thursday, 12:35 p.m. – 2:40 p.m., Room 106
 RC106 4-3-3 Multiphysics of Materials & Interfaces—III: Thursday, 2:55 p.m. – 5:00 p.m., Room 106
 FA106 4-3-4 Multiphysics of Materials & Interfaces—IV: Friday, 9:15 a.m. – 11:20 a.m., Room 106

4-4 Mechanics of Crystalline Nanostructures

- MC207 4-4-1 Carbon-Based Nanostructures: Monday, 2:55 p.m. – 5:00 p.m., Room 207
 TA207 4-4-2 Surface Stress—Experiments and Modeling: Tuesday, 9:15 a.m. – 11:20 a.m., Room 207
 TB207 4-4-3 Plasticity and Failure of Nanowires: Tuesday, 12:35 p.m. – 2:40 p.m., Room 207
 TC207 4-4-4 Plasticity and Failure of Nanocrystalline Materials—I: Tuesday, 2:55 p.m. – 5:00 p.m., Room 207
 WA207 4-4-5 Plasticity and Failure of Composites, Biomaterials, Alloys—I: Wednesday, 9:15 a.m. – 11:20 a.m., Room 207
 RA207 4-4-6 Plasticity and Failure of Nanocrystalline Materials—II: Thursday, 9:15 a.m. – 11:20 a.m., Room 207
 RB207 4-4-7 Plasticity and Failure of Nanocrystalline Materials—III: Thursday, 12:35 p.m. – 2:40 p.m., Room 207
 RC207 4-4-8 Plasticity and Failure of Nanocrystalline Materials—IV: Thursday, 2:55 p.m. – 5:00 p.m., Room 207
 FA207 4-4-9 Plasticity and Failure of Composites, Biomaterials, Alloys—II: Friday, 9:15 a.m. – 11:20 a.m., Room 207

4-5 Mechanics of Materials and Structures for Extreme Environments

- TC1 4-5-1 Mechanics of Materials for Extreme Environments: Tuesday, 2:55 p.m. – 5:00 p.m., Deans Hall 1

4-6 Transforming Visualization of Microstructure into Simulation for Multi-Scale Mechanics

- TA106 4-6-1 Transforming Visualization of Microstructure into Simulation for Multi-Scale Mechanics: Tuesday, 9:15 a.m. – 11:20 a.m., Room 106

4-7 Structural Health Monitoring

- MA108 4-7-4 Celebration of Joseph Rose's Accomplishments in Ultrasonics—I: Monday, 9:15 a.m. – 11:20 a.m., Room 108

- MB108 4-7-5 Celebration of Joseph Rose's Accomplishments in Ultrasonics—II: Monday, 12:35 p.m. – 2:40 p.m., Room 108
- MC108 4-7-6 Celebration of Joseph Rose's Accomplishments in Ultrasonics—III: Monday, 2:55 p.m. – 5:00 p.m., Room 108
- TA108 4-7-7 Celebration of Joseph Rose's Accomplishments in Ultrasonics—IV: Tuesday, 9:15 a.m. – 11:20 a.m., Room 108
- TB108 4-7-1 Structural Health Monitoring—I: Tuesday, 12:35 p.m. – 2:40 p.m., Room 108
- TC108 4-7-2 Structural Health Monitoring—II: Tuesday, 2:55 p.m. – 5:00 p.m., Room 108
- WA108 4-7-3 Structural Health Monitoring—III: Wednesday, 9:15 a.m. – 11:20 a.m., Room 108

4-8 Damage Mechanics of Solids and Structures

- RB211 4-8-1 Damage Mechanics of Solids and Structures—I: Thursday, 12:35 p.m. – 2:40 p.m., Room 211
- RC211 4-8-2 Damage Mechanics of Solids and Structures—II: Thursday, 2:55 p.m. – 5:00 p.m., Room 211
- FA211 4-8-3 Damage Mechanics of Solids and Structures—III: Friday, 9:15 a.m. – 11:20 a.m., Room 211

4-9 Non-Local and Strain Gradient Elasticity, Viscoelasticity, and Plasticity

- MA104 4-9-2 Non-Local and Strain Gradient—I: Monday, 9:15 a.m. – 11:20 a.m., Room 104
- MB104 4-9-3 Non-Local and Strain Gradient—II: Monday, 12:35 p.m. – 2:40 p.m., Room 104
- MC104 4-9-4 Non-Local and Strain Gradient—III: Monday, 2:55 p.m. – 5:00 p.m., Room 104
- TA104 4-9-5 Non-Local and Strain Gradient—IV: Tuesday, 9:15 a.m. – 11:20 a.m., Room 104

4-11 Damage and Failure of Composite Materials

- TB104 4-11-1 Damage and Failure of Composite Materials—I: Tuesday, 12:35 p.m. – 2:40 p.m., Room 104
- TC104 4-11-2 Damage and Failure of Composite Materials—II: Tuesday, 2:55 p.m. – 5:00 p.m., Room 104
- WA104 4-11-3 Damage and Failure of Composite Materials—III: Wednesday, 9:15 a.m. – 11:20 a.m., Room 104

4-12 Mechanics of Low-Dimensional Carbon Materials

- MA105 4-12-1 Graphene-Substrate Interactions: Monday, 9:15 a.m. – 11:20 a.m., Room 105
- MB105 4-12-2 Atomistic Studies of Defected Graphene: Monday, 12:35 p.m. – 2:40 p.m., Room 105
- MC105 4-12-3 Buckling of Multi-Walled Carbon Nanotubes: Monday, 2:55 p.m. – 5:00 p.m., Room 105
- TB105 4-12-5 Mechanics and Thermodynamics of Various Carbon Structures: Tuesday, 12:35 p.m. – 2:40 p.m., Room 105

4-13 Structures and Devices with Multifunctional or Smart Materials: Design and Analysis

- WA105 4-13-1 Devices and Applications Using Multifunctional or Smart Materials: Wednesday, 9:15 a.m. – 11:20 a.m., Room 105
- RA105 4-13-2 Phase Transforming Solids—Experiments, Modeling and Simulations: Thursday, 9:15 a.m. – 11:20 a.m., Room 105
- RB105 4-13-3 Soft Active Materials: Thursday, 12:35 p.m. – 2:40 p.m., Room 105
- RC105 4-13-4 Multifunctional/Smart Material Devices—Computations: Thursday, 2:55 p.m. – 5:00 p.m., Room 105
- FA105 4-13-5 Multifunctional/Smart Composites: Friday, 9:15 a.m. – 11:20 a.m., Room 105

4-14 Electromechanics of Ionic Polymer Metal Composites (IPMCs)

- MA207 4-14-1 Electromechanics of Ionic Polymer Metal Composites (IPMCs)—I: Monday, 9:15 a.m. – 11:20 a.m., Room 207
- MB207 4-14-2 Electromechanics of Ionic Polymer Metal Composites (IPMCs)—II: Monday, 12:35 p.m. – 2:40 p.m., Room 207

4-15 Thermoelasticity, Thermal Stresses, and Thermal Shock

- FA108 4-15-1 Thermal Response of Materials and Structures: Friday, 9:15 a.m. – 11:20 a.m., Room 108

4-16 Macroscopic Properties and Instabilities in Heterogeneous Materials Systems

- MA106 4-16-1 Porous Materials and Cavitation Instabilities: Monday, 9:15 a.m. – 11:20 a.m., Room 106
- MB106 4-16-2 Homogenization Estimates for Advanced Materials: Monday, 12:35 p.m. – 2:40 p.m., Room 106
- MC106 4-16-3 Macroscopic Properties and Instabilities in Composite Materials and Polycrystals: Monday, 2:55 p.m. – 5:00 p.m., Room 106

4-17 Instability of Solids and Structures

- MA1 4-17-1 Instability of Solids and Structures—I: Monday, 9:15 a.m. – 11:20 a.m., Deans Hall 1
- MB1 4-17-2 Instability of Solids and Structures—II: Monday, 12:35 p.m. – 2:40 p.m., Deans Hall 1
- MC1 4-17-3 Instability of Solids and Structures—III: Monday, 2:55 p.m. – 5:00 p.m., Deans Hall 1
- TA1 4-17-4 Instability of Solids and Structures—IV: Tuesday, 9:15 a.m. – 11:20 a.m., Deans Hall 1
- TB1 4-17-5 Instability of Solids and Structures—V: Tuesday, 12:35 p.m. – 2:40 p.m., Deans Hall 1

4-18 Mechanics of Random and Fractal Materials

- TB106 4-18-1 Mechanics of Random Materials—I: Tuesday, 12:35 p.m. – 2:40 p.m., Room 106
TC106 4-18-2 Mechanics of Random Materials—II: Tuesday, 2:55 p.m. – 5:00 p.m., Room 106
WA106 4-18-3 Mechanics of Fractal Materials—III: Wednesday, 9:15 a.m. – 11:20 a.m., Room 106

4-19 Constitutive Modeling of Particulate Material Behavior

- TA109 4-19-1 Constitutive Modeling of Particulate Material Behavior—I: Tuesday, 9:15 a.m. – 11:20 a.m., Room 109
TB109 4-19-2 Constitutive Modeling of Particulate Material Behavior—II: Tuesday, 12:35 p.m. – 2:40 p.m., Room 109

4-20 Mechanics of Advanced Infrastructure Materials

- RC218 4-20-1 Mechanics of Advanced Infrastructure Materials—I: Thursday, 2:55 p.m. – 5:00 p.m., Room 218
FA218 4-20-2 Mechanics of Advanced Infrastructure Materials—II: Friday, 9:15 a.m. – 11:20 a.m., Room 218

4-21 Mechanics of Dissimilar Materials Interfaces

- RA218 4-21-1 Mechanics of Dissimilar Materials Interfaces—I: Thursday, 9:15 a.m. – 11:20 a.m., Room 218
RB218 4-21-2 Mechanics of Dissimilar Materials Interfaces—II: Thursday, 12:35 p.m. – 2:40 p.m., Room 218

4-22 Mechanics of Energy Storage

- MB2 4-22-1 Mechanics of Energy Storage—I: Monday, 12:35 p.m. – 2:40 p.m., Deans Hall 2
MC2 4-22-2 Mechanics of Energy Storage—II: Monday, 2:55 p.m. – 5:00 p.m., Deans Hall 2
TA2 4-22-3 Mechanics of Energy Storage—III: Monday, 9:15 a.m. – 11:20 a.m., Deans Hall 2

4-23 Multi-Scale Modeling and Response of Nano-Structures

- WA1 4-23-1 Multi-Scale Modeling and Response of Nano-Structures: Wednesday, 9:15 a.m. – 11:20 a.m., Deans Hall 1

4-24 Multiscale Modeling of Progressive Failure in Fiber Reinforced Composites

- MA109 4-24-1 Multiscale Modeling of Progressive Failure in Composites—I: Monday, 9:15 a.m. – 11:20 a.m., Room 109
MB109 4-24-2 Multiscale Modeling of Progressive Failure in Composites—II: Monday, 12:35 p.m. – 2:40 p.m., Room 109

- MC109 4-24-3 Multiscale Modeling of Progressive Failure in Composites—III: Monday, 2:55 p.m. – 5:00 p.m., Room 109

4-25 Symposium Honoring Professor Robert M. McMeeking on the Occasion of His 60th Birthday

- TB2 4-25-1 McMeeking—I: Tuesday, 12:35 p.m. – 2:40 p.m., Deans Hall 2
TC2 4-25-2 McMeeking—II: Tuesday, 2:55 p.m. – 5:00 p.m., Deans Hall 2
WA2 4-25-3 McMeeking—III: Wednesday, 9:15 a.m. – 11:20 a.m., Deans Hall 2
RA2 4-25-4 McMeeking—IV: Thursday, 9:15 a.m. – 11:20 a.m., Deans Hall 2
RB2 4-25-5 McMeeking—V: Thursday, 12:35 p.m. – 2:40 p.m., Deans Hall 2
RC2 4-25-6 McMeeking—VI: Thursday, 2:55 p.m. – 5:00 p.m., Deans Hall 2

4-26 Experimental Fracture Mechanics

- FA2 4-26-1 Experimental Fracture Mechanics: Friday, 9:15 a.m. – 11:20 a.m., Deans Hall 2

4-28 Measurement and Modeling of High-Strain-Rate Deformation

- WA107 4-28-1 Measurement and Modeling of High-Strain-Rate Deformation—I: Wednesday, 9:15 a.m. – 11:20 a.m., Room 107
RA107 4-28-2 Measurement and Modeling of High-Strain-Rate Deformation—II: Thursday, 9:15 a.m. – 11:20 a.m., Room 107

4-29 Solid Mechanics as a Framework for Modeling New Phenomena

- RB107 4-29-1 Solid Mechanics as a Framework for Modeling New Phenomena—I: Thursday, 12:35 p.m. – 2:40 p.m., Room 107
RC107 4-29-2 Solid Mechanics as a Framework for Modeling New Phenomena—II: Thursday, 2:55 p.m. – 5:00 p.m., Room 107
FA107 4-29-3 Solid Mechanics as a Framework for Modeling New Phenomena—III: Friday, 9:15 a.m. – 11:20 a.m., Room 107

4-30 Multiscale Mechanical Characterization and Modeling of Porous Materials

- TB218 4-30-1 Multiscale Mechanical Characterization and Modeling of Porous Media—I: Tuesday, 12:35 p.m. – 2:40 p.m., Room 218
TC218 4-30-2 Multiscale Mechanical Characterization and Modeling of Porous Media—II: Tuesday, 2:55 p.m. – 5:00 p.m., Room 218

WA218 4-30-3 Multiscale Mechanical Characterization and Modeling of Porous Media—III: Wednesday, 9:15 a.m. – 11:20 a.m., Room 218

4-31 Cyclic Plasticity of Materials:

Experimentation and Constitutive Modeling at the Micro and Macroscopic Levels

RA108 4-31-1 Cyclic Plasticity—I: Thursday, 9:15 a.m. – 11:20 a.m., Room 108

RB108 4-31-2 Cyclic Plasticity—II: Thursday, 12:35 p.m. – 2:40 p.m., Room 108

RC108 4-31-3 Cyclic Plasticity—III: Thursday, 2:55 p.m. – 5:00 p.m., Room 108

4-32 Thermal Transport Phenomena in

Heterogeneous Materials and Their Interfaces

MA107 4-32-1 Thermal Transport Phenomena—I: Monday, 9:15 a.m. – 11:20 a.m., Room 107

MB107 4-32-2 Thermal Transport Phenomena—II: Monday, 12:35 p.m. – 2:40 p.m., Room 107

Dynamics

5-1 General

TC3 5-1-1 Dynamics of Machines and Mechanisms: Tuesday, 2:55 p.m. – 5:00 p.m., Senate 3

RA104 5-1-3 Wave Propagation and Elastodynamics: Thursday, 9:15 a.m. – 11:20 a.m., Room 104

RB104 5-1-4 Vehicle Dynamics: Thursday, 12:35 p.m. – 2:40 p.m., Room 104

FA3 5-1-2 Special Topics in Nonlinear Dynamics: Friday, 9:15 a.m. – 11:20 a.m., Senate 3

5-3 Recent Advances in Nonlinear Dynamics

RC104 5-3-1 Advances in Nonlinear Dynamics—I: Thursday, 2:55 p.m. – 5:00 p.m., Room 104

FA104 5-3-2 Advances in Nonlinear Dynamics—II: Friday, 9:15 a.m. – 11:20 a.m., Room 104

5-4 Nonlinear Phenomena in Mechanical and Structural Systems

MA3 5-4-1 Nonlinear Phenomena in Fluid-Structure Systems: Monday, 9:15 a.m. – 11:20 a.m., Senate 3

MB3 5-4-2 Nonlinear Phenomena in Parametrically Excited Systems: Monday, 12:35 p.m. – 2:40 p.m., Senate 3

MC3 5-4-3 Analytical and Computational Investigations into Nonlinear Phenomena—I: Monday, 2:55 p.m. – 5:00 p.m., Senate 3

TA3 5-4-4 Analytical and Computational Investigations into Nonlinear Phenomena—II: Tuesday, 9:15 a.m. – 11:20 a.m., Senate 3

TB3 5-4-5 Analytical and Computational Investigations into Nonlinear Phenomena—III: Tuesday, 12:35 p.m. – 2:40 p.m., Senate 3

5-5 Dynamical Data Analysis of Multiscale Systems

RA3 5-5-1 Emerging Methods: Thursday, 9:15 a.m. – 11:20 a.m., Senate 3

RB3 5-5-2 Applications in Physics and Engineering: Thursday, 12:35 p.m. – 2:40 p.m., Senate 3

RC3 5-5-3 Applications in Biology and Medicine: Thursday, 2:55 p.m. – 5:00 p.m., Senate 3

5-7 Nonlinear Dynamics in Physiology and Medicine

WA3 5-7-1 Nonlinear Dynamics in Physiology and Medicine: Wednesday, 9:15 a.m. – 11:20 a.m., Senate 3

5-9 Computational Methods for Dynamical Systems Analysis

WA4 5-9-1 Continuation Methods: Wednesday, 9:15 a.m. – 11:20 a.m., Senate 2

RA4 5-9-2 Integration Methods: Thursday, 9:15 a.m. – 11:20 a.m., Senate 2

5-10 Dynamics and Stability of Human Movement Systems

MA4 5-10-1 Stability & Falling—Definitions & Methods: Monday, 9:15 a.m. – 11:20 a.m., Senate 2

MB4 5-10-2 Computational Modeling of Biodynamics: Monday, 12:35 p.m. – 2:40 p.m., Senate 2

MC4 5-10-3 Complex Dynamics of Walking and Running: Monday, 2:55 p.m. – 5:00 p.m., Senate 2

TA4 5-10-4 External Influences on Human Stability: Tuesday, 9:15 a.m. – 11:20 a.m., Senate 2

TB4 5-10-5 Neuromuscular Control of Movement: Tuesday, 12:35 p.m. – 2:40 p.m., Senate 2

TC4 5-10-6 Quantifying the Dynamics of Human Movement: Tuesday, 2:55 p.m. – 5:00 p.m., Senate 2

CONCURRENT SESSIONS

Monday, June 28

Concurrent Sessions

Monday A, 9:15-11:20 a.m.

Computational Methods

1-1 General

MA112 1-1-1 Extended Finite Element Formulations

9:15 a.m. – 11:20 a.m., Room 112

Organizer: S. Zhang

Session Chair: S. Zhang

9:15 USNCTAM2010-472: *A Galerkin Finite Element Model for Conserved Phase-Fields*, M. A. Zaeem, S. Mesarovic

9:40 USNCTAM2010-1058: *Finite Element Formulations of the Dynamics of Saturated Porous Media*, M. Ulker, S. Rahman

10:05 USNCTAM2010-1115: *High Order Continuous Finite Elements on Tetrahedrals with Local Mass Matrix Inversion*, M. Brazell, B. Helenbrook

10:30 USNCTAM2010-1211: *Harmonic Finite Elements in the Seismic Response Spectrum Analysis of Ground Supported Tank*, B. S. Antaal, Y. Hari, D. K. Williams

1-2 Computational Modeling of Multi-Scale/Multi-Physics Processes in Materials

MA203 1-2-1 Multiscale Dynamical Characterization

9:15 a.m. – 11:20 a.m., Room 203

Organizers: W. K. Liu, F. Vernerey, E. Karpov

Session Chairs: F. Vernerey, E. Karpov

9:05 USNCTAM2010-861: *Multiscale Dynamic Characterization of Composite Materials via Micromorphic Computational Wave Methods*, S. Gonella, M. S. Greene, W. K. Liu

9:40 USNCTAM2010-844: *Coarse Grained Simulation of Atomistic Dynamics of Dislocations*, L. Xiong, Y. Chen

10:05 USNCTAM2010-1012: *The Simulation of Dynamic Crack Propagation Using Coarse-Grained Fracture Dynamics*, Q. Deng, Y. Chen

10:30 USNCTAM2010-665: *A Method to Determine the Transient Thermal and Mechanical Fields in Non-equilibrium Molecular Dynamics Simulations*, M. Kirca, A. To

10:55 USNCTAM2010-433: *The Method of Numerically Explicit Potentials—A Non Concurrent Multiscale Method for Computing the Response of Heterogeneous Nonlinear Structures*, J. Yvonnet, Q.-C. He

Fluid Mechanics

2-2 Non-Classical Turbulence Physics

MA2 2-2-1 Non-Classical Turbulence Physics—I

9:15 a.m. – 11:20 a.m., Deans Hall 2

Organizer: J. Brasseur

Session Chair: P. Orlandi

9:15 USNCTAM2010-480: *Five Centuries of Turbulence: from da Vinci, to Kolmogorov, to the Universal Log Law*, M. Gad-el-Hak, M. H. Buschmann

9:40 USNCTAM2010-946: *Two Classes of Small-Scale Turbulence? J. C. Vassilicos, N. Mazellier*

10:05 USNCTAM2010-483: *Discovering Non Kolmogorov Couplings within the Complexity of Nonlinear Multi-scale Dynamics*, J. Brasseur

10:30 USNCTAM2010-1111: *Effect of Initial Conditions on the Asymptotic Behavior of Homogeneous Turbulent Shear Flow*, J. C. Isaza, L. R. Collins

10:55 USNCTAM2010-987: *Stochastically Forced Plane Couette Flow: DNS and Non-Modal Analysis*, G. Khujadze, M. Oberlack, G. Chagelishvili

2-5 Free-Surface Flows

MA211 2-5-1 Free-Surface Flows—I

9:15 a.m. – 11:20 a.m., Room 211

Organizers: H. Stone, A. Belmonte

Session Chair: H. Stone

9:15 USNCTAM2010-389: *Electrohydrodynamic Tip-Streaming and Emission of Charged Drops from Liquid Cones*, R. T. Collins, J. J. Jones, M. T. Harris, O. Basaran

9:40 USNCTAM2010-390: *Computational Analysis of Viscoelastic Jet/Drop Breakup*, P. P. Bhat, S. Appathurai, M. T. Harris, M. Pasquali, O. Basaran

Concurrent Sessions—Monday continued

- 10:05 USNCTAM2010-1089: *Drop-on-Demand Printing of Personalized Medicines*, B. Khusid, E. Elele, Y. Shen, P. Palle, O. Basaran, R. T. Collins, P. T. McGough
- 10:30 USNCTAM2010-1263: *Numerical Simulation and Physics of Drop Breakup in High Speed Gas Flows*, C.-H. Chang, X. Deng, T. G. Theofanous
- 10:55 USNCTAM2010-1410: *Planar Extensional Motion of an Inertially-Driven Liquid Sheet*, L. Smolka, T. P. Witelski

2-6 Transport in Microscale and Laminar Flows

MA219 2-6-1 Transport in Microscale and Laminar Flows—I

9:15 a.m. – 11:20 a.m., Room 219

Organizers: N. Aubry, M. Stremmer

Session Chairs: N. Aubry, M. Stremmer

- 9:15 USNCTAM2010-691: *Combining Hydrodynamic and Electrical Forces to Understand and Control Particles at Fluid-Liquid Interfaces*, N. Aubry, P. Singh, M. Janjua, S. Nudurupati, D. Joseph
- 9:40 USNCTAM2010-567: *Microfluidic, Porous Bead-Based Assay: Theory and Experiments*, J. Thompson, H. Bau
- 10:05 USNCTAM2010-639: *Numerical Simulations of Pattern Formation During the Evaporation of Drops Containing Colloidal Particles*, R. Bhardwaj, X. Fang, P. Somasundaran, D. Attinger
- 10:30 USNCTAM2010-640: *Porous Membrane for Bubbles Removal in Microfluidic Channels: Physical Mechanisms and Design Criteria*, J. Xu, R. Vaillant, D. Attinger
- 10:55 USNCTAM2010-1100: *Microfluidic-Component Optimization Based on Lagrangian Diagnostics and Eulerian Indicators of Mixing*, D. Mott, K. McIlhany, G. Voth, S. Wiggins, E. Oran

Biomechanics

3-2 Mechanics of Biological and Bioinspired Materials

MA206 3-2-1 Experimental Bone Mechanics

9:15 a.m. – 11:20 a.m., Room 206

Organizer: I. Jasiuk

Session Chairs: I. Jasiuk, J. McKittrick

- 9:15 USNCTAM2010-1324: *Hierarchy in Tissue Level Bone Mechanical Properties*, V. Ferguson, M. Oyen, R. Pajetta, S. Olesiak

- 9:40 USNCTAM2010-1202: *Deformation of Demineralized and Deproteinized Bone*, J. McKittrick, P.-Y. Chen, D. Toroian, P. Price
- 10:05 USNCTAM2010-1177: *Bone Isotropy Characterization under Fatigue Loading Within the Vertebral Body*, A. Valdevit, S. R. Chung, V. Jakimaviciute, A. Ritter, T. Errico
- 10:30 USNCTAM2010-545: *Characterization of Poroelastic Properties of Hydrated Tissues by Indentation Testing*, M. Oyen, M. Galli, T. Shean
- 10:55 USNCTAM2010-825: *Conservative Treatment of Weight Bearing Joints for Patients with Osteoarthritis*, P. A. Pop, L. Lazar, F. M. Marcu

3-10 TMJ Biomechanics

MA208 3-10-1 Biomechanics of the Temporomandibular Joint

9:15 a.m. – 11:20 a.m., Room 208

Organizers: M. Detamore, A. Almarza

Session Chairs: A. Almarza, M. Detamore

- 9:15 USNCTAM2010-1403: *Mandibular Deformation and TMJ Biomechanics*, B. Zaugg, L. Gallo
- 9:40 USNCTAM2010-1172: *Botulinum Toxin Use in Jaw Muscles: Consequences for the TMJ*, K. Rafferty, Z.-J. Liu, W. Ye, T. Gross, S. Herring
- 10:05 USNCTAM2010-362: *Simulation of the TMJ Complex under Quasistatic and Dynamic Loads—Analysis of Different Temporomandibular Disorders*, A. P. del Palomar, M. Doblare
- 10:30 USNCTAM2010-355: *Sensitivity of Loading Direction on Dynamic Shear Behavior of Condylar Cartilage-on-Bone*, E. Tanaka, S. Kuroda, N. Kawai, T. Izawa, Y. Iwabuchi, T. Inubushi, K. Tanimoto
- 10:55 USNCTAM2010-1127: *Biomechanical Analysis of the Rabbit Temporomandibular Joint*, A. Almarza, S. E. Henderson

Mechanics of Materials and Structures

4-2 Dynamic Response of Materials

MA218 4-2-1 Dynamic Response of Materials—I

9:15 a.m. – 11:20 a.m., Room 218

Organizers: K. Ravi-Chandar, G. Subhash, P. H. Geubelle
Session Chair: K. Ravi-Chandar

- 9:15 USNCTAM2010-563: *Computational Modeling of the Variability in Defect Dominated Dynamic Failure Strengths in Brittle Materials*, N. Daphalapurkar, K. T. Ramesh, J.-F. Molinari, L. Graham-Brady

Concurrent Sessions—Monday continued

- 9:40 USNCTAM2010-1298: *Peridynamic Models for Dynamic Fracture in Brittle Materials: Crack Branching Cascades and the Influence of the Loading Conditions*, F. Bobaru, Y. D. Ha
- 10:05 USNCTAM2010-724: *Dynamic Tensile Response of Porcine Muscle*, X. Nie, J.-I. Cheng, W. Chen, T. Weerasooriya
- 10:30 USNCTAM2010-1400: *Dynamic Tensile Response of Soft Materials*, J. Niemczura, K. Ravi-Chandar

4-7 Structural Health Monitoring

MA108 4-7-4 Celebration of Joseph Rose's Accomplishments in Ultrasonics—I

9:15 a.m. – 11:20 a.m., Room 108

Organizers: C. Lissenden, D. E. Adams
Session Chair: C. Lissenden

- 9:15 **Keynote Presentation:** USNCTAM2010-961: *Ultrasonic Guided Wave Success Stories and Challenges in NDT and SHM*, J. L. Rose
- 10:05 USNCTAM2010-396: *The Effect of Heat Treatment on Acoustic Nonlinear Parameters of Inconel*, W. Li, Y. Cho, J. Lee, I. Park
- 10:30 USNCTAM2010-384: *Inline Testing of ERW Tubes Using Ultrasonic Guided Wave EMATS*, H. Gao, B. Lopez, S. Ali, J. Flora, J. Monks
- 10:55 USNCTAM2010-1329: *Circumferential Guided Wave Methods for the In-Line Inspection of Pipe*, J. K. Van Velsor, J. L. Rose, L. Zhang

4-9 Non-Local and Strain Gradient Elasticity, Viscoelasticity, and Plasticity

MA104 4-9-2 Non-Local and Strain Gradient—I

9:15 a.m. – 11:20 a.m., Room 104

Organizers: R. K. Abu Al-Rub, X.-L. Gao
Session Chairs: R. K. Abu Al-Rub, X.-L. Gao

- 9:15 **Keynote Presentation:** USNCTAM2010-1138: *A Gradient Theory of Single-Crystal Plasticity*, L. Anand
- 10:05 USNCTAM2010-869: *Strain Gradient Elasticity Solution for the Eshelby-Type Problem of a Circular Inclusion in a Finite Matrix*, H. Ma, X.-L. Gao
- 10:30 USNCTAM2010-1382: *A Study of Bicrystal Deformation and the Development of Lattice Curvature as Predicted by Micropolar Crystal Plasticity*, J. Mayeur, D. McDowell

- 10:55 USNCTAM2010-1158: *On the Higher-Order Nonlocal Gradient Crystal Plasticity Based on the Flow of Statistically Stored and Geometrically Necessary Dislocation Densities*, R. K. Abu Al-Rub

4-12 Mechanics of Low-Dimensional Carbon Materials

MA105 4-12-1 Graphene-Substrate Interactions

9:15 a.m. – 11:20 a.m., Room 105

Organizers: S. Zhang, V. Shenoy, J. Huang, A. To
Session Chair: A. To

- 9:15 USNCTAM2010-495: *Adhesion-Delamination of Graphene Sheets on Various Substrates*, Z. Zong, Y. Fan, G. Li, K. Wan
- 9:40 USNCTAM2010-525: *Partial-Epitaxial Morphology of Graphene Nanoribbon and Nanoflake on the Si-Terminated SiC(0001) Surfaces*, V. Sorkin, Y. W. Zhang
- 10:05 USNCTAM2010-603: *Morphological Stability of a Graphene Monolayer on an Oxide Substrate*, Z. Aitken, R. Huang
- 10:30 USNCTAM2010-1193: *Mechanics of Graphene Scrolling*, T. Li, Z. Zhang
- 10:55 USNCTAM2010-1195: *In Situ Scanning Tunneling Microscopy Studies of Graphene Growth on Pd and Ni Surfaces*, S. Kodambaka

4-14 Electromechanics of Ionic Polymer Metal Composites (IPMCs)

MA207 4-14-1 Electromechanics of Ionic Polymer Metal Composites (IPMCs)—I

9:15 a.m. – 11:20 a.m., Room 207

Organizers: M. Shahinpoor, K. J. Kim
Session Chair: M. Shahinpoor

- 9:15 USNCTAM2010-304: *Electromechanics Modeling of IPMCs-Fundamentals*, M. Shahinpoor
- 9:40 USNCTAM2010-308: *Nano-Scale Electro-Chemo-Mechanical Modeling of Actuation and Sensing of Ionic Polymer-Metal Composites*, S. Nemat-Nasser
- 10:05 USNCTAM2010-519: *Measurement of the Nonlinear Electro-Mechanical Transduction Gain of an IPMC*, K. Takagi, K. Shiiba, K. Asaka
- 10:30 USNCTAM2010-569: *Energy Harvesting from Underwater Vibration of Ionic Polymer Metal Composites*, M. Aureli, C. Prince, M. Porfiri, S. D. Peterson
- 10:55 USNCTAM2010-720: *Temporally-Resolved Hydrodynamics in the Vicinity of a Vibrating Ionic Polymer Metal Composite*, C. Prince, W. Lin, J. Lin, S. Peterson, M. Porfiri

Concurrent Sessions—Monday continued

4-16 Macroscopic Properties and Instabilities in Heterogeneous Materials Systems

MA106 4-16-1 Porous Materials and Cavitation Instabilities

9:15 a.m. – 11:20 a.m., Room 106

Organizers: O. Lopez-Pamies, P. Ponte Castaneda

Session Chairs: P. Ponte Castaneda, J.-B. Leblond

9:15 USNCTAM2010-398: *Toward a Gurson-Type Model for Porous Ductile Materials Containing Arbitrary Ellipsoidal Voids*, J.-B. Leblond, K. Madou

9:40 USNCTAM2010-399: *Localization Analysis of Porous Metals via Homogenization Models Incorporating Microstructure Evolution*, K. Danas, P. Ponte Castaneda

10:05 USNCTAM2010-1098: *Constitutive Models and Numerical Simulations for Porous Polycrystalline Metals*, M. Idiart, R. Lebensohn, P. Ponte Castaneda

10:30 USNCTAM2010-945: *Spontaneous Dynamic Expansion of Spherical Cavities in Porous Solids under Remote Uniform Tension*, T. Cohen, D. Durban

10:55 USNCTAM2010-457: *An Iterated Homogenization Method to Study Cavitation in Hyperelastic Solids*, O. Lopez-Pamies, M. Idiart, T. Nakamura

4-17 Instability of Solids and Structures

MA1 4-17-1 Instability of Solids and Structures—I

9:15 a.m. – 11:20 a.m., Deans Hall 1

Organizers: S. Kyriakides, T. Healey, N. Triantafyllidis

Session Chairs: P. Ponte Castaneda, S. Daly

9:15 USNCTAM2010-456: *Failure Surfaces for Fiber-Reinforced Elastomers under General 3D Loading Conditions*, O. Lopez-Pamies, M. Idiart

9:40 USNCTAM2010-679: *Thermoplastic Elastomers: Multiscale Modeling, Microstructure Evolution and Macroscopic Instabilities*, P. Ponte Castaneda, O. Lopez-Pamies, V. Racherla

10:05 USNCTAM2010-746: *Nano- and Macro-Scale Phase Field Modeling of Martensitic Phase Transformations*, V. I. Levitas

10:30 USNCTAM2010-1337: *On the Instability Phenomena in the Stress-Induced Phase Transitions in a Thin SMA Strip*, H.-H. Dai, Z. Cai

10:55 USNCTAM2010-1397: *Experimental Studies of Phase Transformation in Shape Memory Alloys*, K. Kim, S. Daly

4-24 Multiscale Modeling of Progressive Failure in Fiber Reinforced Composites

MA109 4-24-1 Multiscale Modeling of Progressive Failure in Composites—I

9:15 a.m. – 11:20 a.m., Room 109

Organizers: A. Waas, B. Bednarczyk, S. Arnold

Session Chair: B. Bednarczyk

9:15 USNCTAM2010-1056: *Multiscale Modeling of Carbon Fiber Reinforced Ceramic Matrix Composites in High Temperature Oxidative Environments*, V. Sundararaghavan, S. Lee

9:40 USNCTAM2010-949: *Multiscale Modeling of Fatigue in Fiber-Reinforced Composites*, C. Oskay, R. D. Crouch

10:05 USNCTAM2010-1240: *Analytical and Numerical Modeling of Fiber-Pullout and Bridging Zone Micromechanics in Fiber Reinforced Composites*, S. S. Rudraraju, P. Prabhakar, K. Garikipati, A. Waas

10:30 USNCTAM2010-546: *A Building-Block Approach to Modeling Adhesively Bonded Composite Joints*, S. Stapleton, A. Waas, B. Bednarczyk

10:55 USNCTAM2010-427: *Integrated Multiscale Micromechanics Analysis Codes for Progressive Failure Analysis of Composite Structures*, B. Bednarczyk, S. Arnold

4-32 Thermal Transport Phenomena in Heterogeneous Materials and Their Interfaces

MA107 4-32-1 Thermal Transport Phenomena—I

9:15 a.m. – 11:20 a.m., Room 107

Organizers: A. Roy, T. Fisher

Session Chair: J. Qu

9:05 USNCTAM2010-587: *Effects of Interwall Thermal Resistance on the Thermal Conductivity of Multiwall Carbon Nanotubes*, E. A. Walker, G. Walker

9:40 USNCTAM2010-774: *Thermal Conductivity of Ultra-Thin Polyaniline Films*, J. Jin, M. Manoharan, A. Haque, Q. Wang

10:05 USNCTAM2010-1094: *Phonon Transmission in Functionalized Carbon Nanotube: Wave Packet Study*, J. Lee, V. Varshney, A. Roy, B. Farmer

10:30 USNCTAM2010-1260: *Spacetime Method for Linearized Thermoelastodynamics with Hyperbolic Conduction*, S. Miller, R. Haber

Concurrent Sessions—*Monday continued*

Dynamics

5-4 Nonlinear Phenomena in Mechanical and Structural Systems

MA3 5-4-1 Nonlinear Phenomena in Fluid-Structure Systems

9:15 a.m. – 11:20 a.m., Senate 3

Organizers: A. J. Dick, B. Balachandran

Session Chairs: A. J. Dick, B. Balachandran

9:15 **Keynote Presentation:** USNCTAM2010-407: *Vibro-Wind Energy Harvesting: An Application of Nonlinear Fluid-Structure Dynamics*, F. Moon, S. T. Oh, R. Banai

10:05 USNCTAM2010-338: *An Elementary, Fundamental Analysis of Vortex-Induced Vibration in Pipeline Spans*, P. R. Paslay

10:30 USNCTAM2010-926: *Hyperchaos in Shells Subjected to Internal Flow and External Transverse Periodic Loads*, K. Karagiozis, M. Amabili, M. Paidoussis

10:55 USNCTAM2010-1025: *Identifying Dynamical Boundaries and Phase Space Transport Using Lagrangian Coherent Structures*, P. Tallapragada, S. Ross

5-10 Dynamics and Stability of Human Movement Systems

MA4 5-10-1 Stability & Falling—Definitions & Methods

9:15 a.m. – 11:20 a.m., Senate 2

Organizers: M. Tanaka, J. Dingwell

Session Chairs: C. Q. Wu, J. Seipel

9:15 USNCTAM2010-915: *Detecting Dynamical Boundaries from Kinematic Data in Biomechanics*, S. Ross, M. Tanaka, C. Senatore

9:40 USNCTAM2010-947: *How Come a Moving Biped Does Not Fall*, D. Renjewski, A. Seyfarth

10:05 USNCTAM2010-1103: *Comparing Floquet and Empirical Mechanical Stability in a Neuromusculoskeletal Model*, M. Talaty, A. van den Bogert

10:30 USNCTAM2010-828: *The Validity of Stability Measures: A Modeling Approach*, S. M. Bruijn, D. J. J. Bregman, O. G. Meijer, P. J. Beek, J. H. Van Dieen

10:55 USNCTAM2010-624: *Influence of Neuromuscular Noise on Movement Variability and Risk of Falling in a 3D Dynamic Walking Model*, P. Roos, J. Dingwell

Concurrent Sessions

Monday B, 12:35-2:40 p.m.

Computational Methods

1-1 General

MB112 1-1-2 Computational Methods for Dynamic Problems

12:35 p.m. – 2:40 p.m., Room 112

Organizer: S. Zhang

Session Chair: S. Nair

12:35 USNCTAM2010-464: *Computational Solution Methods for One-Dimensional Unsteady Heat Problem*, T. Menon

1:00 USNCTAM2010-921: *The Fluid Structure Interactions between a Tensioned Web and an Externally Pressurized Hollow Drum*, E. Lopez, S. Muftu

1:25 USNCTAM2010-1037: *Stabilized Formulations for Modified Brinkman Equation*, S. Srinivasan, K. B. Nakshatrala

1:50 USNCTAM2010-1265: *A Computational Framework for Coupled Deformation-Diffusion Analysis*, K. B. Nakshatrala

2:15 USNCTAM2010-1284: *A Space-Time Geodesic Formulation of Classical Mechanics with Application*, S. Nair

1-2 Computational Modeling of Multi-Scale/Multi-Physics Processes in Materials

MB203 1-2-2 Multiphase and Atomistic-to-Continuum Coupling Methods

12:35 p.m. – 2:40 p.m., Room 203

Organizers: W. K. Liu, F. Vernerey, E. Karpov

Session Chairs: E. Karpov, D. Qian

12:35 **Keynote Presentation:** USNCTAM2010-1253: *A Triphasic Inelastic Model to Study Fibroblast Deformation*, F. Vernerey, M. Farsad

1:25 USNCTAM2010-683: *On Matching Discrete and Continuum Models*, H. Zhao, G. Rodin

1:50 USNCTAM2010-1112: *A Field Theoretic Approach to the Quasi-Continuum Method*, M. Iyer, V. Gavini

2:15 USNCTAM2010-1242: *Modeling Surface Effect via Boundary Cauchy-Born Method*, M. J. Abdolhosseini Qomi, A. Aghaei, A. R. Khoei

Concurrent Sessions—Monday continued

Fluid Mechanics

2-3 High Reynolds Number Turbulence

MB205 2-3-1 Wall-Bounded Turbulence with Roughness and Other Perturbations

12:35 p.m. – 2:40 p.m., Room 205

Organizer: A. Smits

Session Chair: A. Smits

12:35 USNCTAM2010-528: *Preponderance of Hairpin Vortices in a Quasi Standard Boundary Layer with Free-Stream Periodically Passing Wakes*, X. Wu

1:00 USNCTAM2010-618: *Scaling of Near-Wall Turbulence in Pipe Flow*, M. Hultmark, S. C. C. Bailey, A. Smits

1:25 USNCTAM2010-654: *Velocity Statistics of Rough-Wall Channel Flow*, D. Birch, J. Morrison

1:50 USNCTAM2010-1173: *Turbulence Production by Rough Boundaries*, R. Leighton, K. Bhaganagar

2:15 USNCTAM2010-568: *Low-Order Representations of Irregular Surface Roughness and Their Impact on a Turbulent Boundary Layer*, R. Mejia-Alvarez, K. Christensen

2-5 Free-Surface Flows

MB211 2-5-2 Free-Surface Flows—II

12:35 p.m. – 2:40 p.m., Room 211

Organizers: H. Stone, A. Belmonte

Session Chair: A. Belmonte

12:35 USNCTAM2010-513: *Air-Ventilated Surface Flow under Horizontal Wall*, K. Matveev

1:00 USNCTAM2010-584: *Folding Films, Inverse Coarsening, and the Bubble-Bursting Cascade*, J. C. Bird, R. de Ruiter, H. Stone

1:25 USNCTAM2010-928: *The Effect of Slip at a Fluid Interface on Coalescence between Two Viscous Drops in a Viscous Fluid*, G. Leal, A. Ramachandran, K. Tsiglifis, A. Roy

1:50 USNCTAM2010-1010: *The Role of Erosion at the Head of Suspension Currents*, C. Carroll, B. Turnbull, M. Louge

2:15 USNCTAM2010-599: *Low Reynolds Number Swimming Near Walls and Free Surfaces*, D. Crowdy

2-6 Transport in Microscale and Laminar Flows

MB219 2-6-2 Transport in Microscale and Laminar Flows—II

12:35 p.m. – 2:40 p.m., Room 219

Organizers: N. Aubry, M. Stremmler

Session Chairs: N. Aubry, M. Stremmler

12:35 USNCTAM2010-1108: *Determining Flow Parameters for Continuous Size-Based Particle Separation in a Microfluidic Device*, B. Shaparenko, H. Hu

1:00 USNCTAM2010-388: *Electrokinetically-Driven Flows in Swelling Porous Media*, B. S. Tilley, B. Vernescu, J. D. Plummer

1:25 USNCTAM2010-565: *Magneto Hydrodynamic Microfluidics and Equivalence with Pressure-Driven Flow*, M. Qin, H. Bau

1:40 USNCTAM2010-824: *Analysis and Modeling of Two-Phase Electrohydrodynamic Instability*, J. Zhang, V. R. T. Narayanan, J. D. Zahn, H. Lin

1:50 USNCTAM2010-1001: *Dielectrophoretic Particle-Particle Interactions*, Y. Ai, S. Qian

Biomechanics

3-2 Mechanics of Biological and Bioinspired Materials

MB206 3-2-2 Modeling of Bone

12:35 p.m. – 2:40 p.m., Room 206

Organizer: I. Jasiuk

Session Chairs: M.-G. Ascenzi, M. K. Tate

12:35 USNCTAM2010-562: *Patient-Specific Multi-Scale Modeling of Femoral Compact Bone*, M.-G. Ascenzi, J. H. Keyak

1:00 USNCTAM2010-1288: *Identification of Bone Structure from Effective Properties*, E. Cherkaev, C. Bonifasi-Lista

1:25 USNCTAM2010-1194: *Micromechanics of the Rate Dependent Elastic-Plastic Behavior of Trabecular Bone*, T. P. M. Johnson, S. Socrate, M. C. Boyce

1:50 USNCTAM2010-1008: *Multiscale Mechanobiology of Bone—Insights from the Interface of Fluid and Solid Mechanics*, M. K. Tate, I. Jasiuk, P. Vanka

2:15 USNCTAM2010-886: *Bone Remodeling Around Dental Implant Systems*, H.-Y. Chou, S. Muftu

Concurrent Sessions—*Monday continued*

3-6 Molecular and Cellular Biomechanics: Adhesion, Cell-ECM Interaction, and Mechanotransduction

MB208 3-6-1 Protein Mechanics

12:35 p.m. – 2:40 p.m., Room 208

Organizers: S. Zhang, G. Bao, H. Gao, J. Hsia, J. Li, K. Grosh

Session Chair: X. Chen

12:35 **Keynote Presentation:** USNCTAM2010-529: *Neuroblast and Structural Protein Responses to Mechanical Strain*, S.-Y. Chou, C.-M. Cheng, Y.-W. Lin, C.-C. Chen, P. R. LeDuc

1:25 USNCTAM2010-829: *Force Microscopy: Estimating Local Forces in a Biological Tissue Network Based on its Geometry*, H. Parameswaran, A. Araujo, B. Suki,

1:50 USNCTAM2010-1043: *Continuum Modeling and Simulation of Gating of Mechanosensitive Channel of Large Conductance*, C. Xi, X. Chen, Y. Tang

2:15 USNCTAM2010-1105: *Cooperative Interactions between Myosin II and Actin Cross-Linking Proteins during Mechanosensing*, T. Luo, D. N. Robinson

Mechanics of Materials and Structures

4-2 Dynamic Response of Materials

MB218 4-2-2 Dynamic Response of Materials—II

12:35 p.m. – 2:40 p.m., Room 218

Organizers: K. Ravi-Chandar, G. Subhash, P. H. Geubelle

Session Chair: P. H. Geubelle

12:35 USNCTAM2010-794: *Scaling Relationships for Large Amplitude Waves in Heterogeneous Materials*, T. Vogler, D. Grady, J. Borg

1:00 USNCTAM2010-1080: *Micromechanical Simulations of Impact Loading on Polymer Bonded Explosives*, A. Barua, M. Zhou

1:25 USNCTAM2010-1279: *Fluid-Structure Interaction of Submerged Tubes Subjected to Impact-Generated Stress Waves*, J. Damazo, R. Porowski, K. Inaba, J. E. Shepherd

1:50 USNCTAM2010-1106: *Crack Initiation and Propagation in Single Crystal Quartz*, A. Tonge, K. T. Ramesh, J. Kimberley

4-7 Structural Health Monitoring

MB108 4-7-5 Celebration of Joseph Rose's Accomplishments in Ultrasonics—II

12:35 p.m. – 2:40 p.m., Room 108

Organizers: C. Lissenden, D. E. Adams

Session Chair: J. K. Van Velsor

12:35 USNCTAM2010-765: *Guided Wave Based Health Monitoring of Composite Structures*, A. Mal

1:00 USNCTAM2010-964: *Developments in Sensing and Imaging for Civil Structures*, J. Popovics

1:25 USNCTAM2010-553: *Nondestructive Evaluation of a Boiler Tube with Wall Thinning Using Ultrasonic Guided Waves*, F. Yan

1:50 USNCTAM2010-1278: *Wireless Guided Wave Transducer Network for Bridge Structural Health Monitoring*, X. Zhao

2:15 USNCTAM2010-320: *Health Monitoring of Aluminum Joint with Fasteners Using Guided Waves*, C. Lissenden, H. Cho

4-9 Non-Local and Strain Gradient Elasticity, Viscoelasticity, and Plasticity

MB104 4-9-3 Non-Local and Strain Gradient—II

12:35 p.m. – 2:40 p.m., Room 104

Organizers: R. K. Abu Al-Rub, X.-L. Gao

Session Chairs: S. Li, R. K. Abu Al-Rub

12:35 USNCTAM2010-645: *Configurational Compatibility and Gauge-Invariant Strain Gradient Plasticity*, S. Li

1:00 USNCTAM2010-1257: *On the Thermodynamic Consistency of Higher-Order Gradient Plasticity Theory*, R. K. Abu Al-Rub, M. Darabi

1:25 USNCTAM2010-1413: *Modeling Fracture in Hierarchical Materials with a Multiscale Micromorphic Model*, F. Vernerey

1:50 USNCTAM2010-1412: *An Alternative Treatment of Adhesive Contact Problems Using the Green-Zerna Potential*, S. Zhou, X.-L. Gao

2:15 USNCTAM2010-1248: *NonLocal Boundary Layer (NBL) Model for the Analysis of Quasibrittle Structures*, Z. Bazant, C. G. Hoover, J. Le

4-12 Mechanics of Low-Dimensional Carbon Materials

MB105 4-12-2 Atomistic Studies of Defected Graphene

12:35 p.m. – 2:40 p.m., Room 105

Organizers: S. Zhang, V. Shenoy, J. Huang, A. To

Concurrent Sessions—Monday continued

Session Chair: X. Huang

- 12:35 USNCTAM2010-715: *Heat Welding of Single-Walled Carbon Nanotubes: A Molecular Dynamics Study*, X. Yang, M. Kirca, A. To
- 1:00 USNCTAM2010-920: *In-Situ Nanomechanics of Carbon Nanotubes and Graphene*, J. Huang
- 1:25 USNCTAM2010-1057: *Strain-Mediated Migration of Vacancy Defects in Graphene*, S. Terdalkar, J. J. Renicis, S. Zhang
- 1:50 USNCTAM2010-1241: *Nanoscale Continuum Calculation of Basal Dislocation Core Structures in Graphite*, B. Yang, M. Barsoum

4-14 Electromechanics of Ionic Polymer Metal Composites (IPMCs)

MB207 4-14-2 Electromechanics of Ionic Polymer Metal Composites (IPMCs)—II

12:35 p.m. – 2:40 p.m., Room 207

Organizers: M. Shahinpoor, K. J. Kim

Session Chair: K. J. Kim

- 12:35 **Keynote Presentation:** USNCTAM2010-305: *Electromechanical and Electrochemical Modeling of Ionic-Gel Based Electroactive Polymer (EAP) Actuators*, K. Asaka
- 1:25 USNCTAM2010-307: *IPMC Force Distribution Map Measurement*, M. Martinez
- 1:50 USNCTAM2010-462: *Full Scale Fast 3D Model of IPMC*, D. Pugal, A. Aabloo, K. J. Kim
- 2:15 USNCTAM2010-675: *Characterization and Modeling of Temperature-Dependent Behavior of Ionic Polymer-Metal Composite Sensors*, T. Ganley, D. L. S. Hung, G. Zhu, X. Tan

4-16 Macroscopic Properties and Instabilities in Heterogeneous Materials Systems

MB106 4-16-2 Homogenization Estimates for Advanced Materials

12:35 p.m. – 2:40 p.m., Room 106

Organizers: O. Lopez-Pamies, P. Ponte Castaneda

Session Chairs: O. Lopez-Pamies, P. Ponte Castaneda

- 12:35 USNCTAM2010-1435: *Dilute Estimates for Magneto-Rheological Elastomers at Small Strains and Rotations*, M. H. Siboni, P. Ponte Castaneda
- 1:00 USNCTAM2010-386: *Optimal Lower Bounds on the Local Stress Inside Random Thermoelastic Composites*, R. Lipton, Y. Chen

- 1:25 USNCTAM2010-1291: *Dynamic Homogenization of a Non-Linear Lattice*, E. Cherkaev, A. Cherkaev
- 1:50 USNCTAM2010-968: *The Structure of the Paraelectric—Ferroelectric Phase Boundary Interface*, A. Kontsos, C. M. Landis
- 2:15 USNCTAM2010-851: *Electrostriction of Heterogeneous Media*, K. Bhattacharya

4-17 Instability of Solids and Structures

MB1 4-17-2 Instability of Solids and Structures—II

12:35 p.m. – 2:40 p.m., Deans Hall 1

Organizers: S. Kyriakides, T. Healey, N. Triantafyllidis

Session Chairs: E. Corona, R. Huang

- 12:35 USNCTAM2010-604: *Swell Induced Surface Instability of Confined Hydrogel Layers on Substrates*, M. K. Kang, R. Huang
- 1:00 USNCTAM2010-833: *Herringbone Buckling Patterns of Anisotropic Thin Films on Elastomeric Substrates*, J. Song
- 1:25 USNCTAM2010-1000: *FEA of Buckle-Driven Delamination of Thin Films on Compliant Substrates Using Cohesive Elements*, E. Corona, E. D. Reedy, N. R. Moody
- 1:50 USNCTAM2010-810: *Dynamics of Self-Healing Slip Pulses on Velocity-Weakening Interfaces: Steady Propagation, Stability Properties and Interaction with Stress Heterogeneity*, A. Elbanna, N. Lapusta, T. Heaton
- 2:15 USNCTAM2010-506: *The Role of Spinodal Region in the Kinetics of Lattice Phase Transitions*, A. Vainchtein

4-22 Mechanics of Energy Storage

MB2 4-22-1 Mechanics of Energy Storage—I

12:35 p.m. – 2:40 p.m., Deans Hall 2

Organizers: R. McMeeking, M. Kamlah, P. Sofronis

Session Chair: M. Kamlah

- 12:35 **Keynote Presentation:** USNCTAM2010-850: *The Role of Stress in Lithium-Ion Batteries*, K. Bhattacharya
- 1:25 USNCTAM2010-481: *Multifunctional Performance of Structure-Energy Storage Composites*, M. A. S. Qidwai, J. Thomas, W. Pogue III, G. Pham
- 1:50 USNCTAM2010-538: *Single Particle Model for Lithium Diffusion and Stress Generation in an Intercalation Electrode*, E. Bohn, T. Eckl, M. Kamlah, J. Christensen, R. McMeeking

Concurrent Sessions—Monday continued

4-24 Multiscale Modeling of Progressive Failure in Fiber Reinforced Composites

MB109 4-24-2 Multiscale Modeling of Progressive Failure in Composites—II

12:35 p.m. – 2:40 p.m., Room 109

Organizers: A. Waas, B. Bednarczyk, S. Arnold

Session Chair: S. Arnold

12:35 USNCTAM2010-1013: *Coarse-Grained Fracture Dynamics of Wood Cell Wall Layer*, Q. Deng, Y. Chen

1:00 USNCTAM2010-1411: *An Experimental and Computational Investigation of the Energy Absorption Characteristics of Multiphase Composite Crush Tubes*, J. W. Hutchins, B. R. Crawley, J. Yu, K. Narasimhan, T. M. Ricks, T. E. Lacy Jr, S. Roy, B. Bednarczyk

1:25 USNCTAM2010-980: *Mesoscale Modeling of the Inelastic Behavior of Polymer Composites*, X. Poulain, R. K. Goldberg, A. A. Benzerga

1:50 USNCTAM2010-1432: *A Hybrid Finite Element Method for Stress Concentration in a Single Fibre Composite*, R. Paskaramoorthy, S. Bugarin, R. G. Reid

2:15 USNCTAM2010-1139: *Modeling Dynamic Fracture and Damage in Unidirectional Fiber-Reinforced Composites with Peridynamics*, W. Hu, F. Bobaru, Y. D. Ha

4-32 Thermal Transport Phenomena in Heterogeneous Materials and Their Interfaces

MB107 4-32-2 Thermal Transport Phenomena—II

12:35 p.m. – 2:40 p.m., Room 107

Organizers: A. Roy, T. Fisher

Session Chair: A. Roy

12:35 USNCTAM2010-467: *Thermal Resistance at the Interface between a Carbon Nanotube and a Silicon Chip*, A. Cao, J. Qu

1:00 USNCTAM2010-422: *On the Thermal Conductivity Anisotropy of a Carbon Nanotube Array Laminated Composite Material*, J. L. Abot, V. Raghavan, G. Bardin, N. Govindaraju, Y. Song

1:25 USNCTAM2010-600: *Electromagnetic Radiation Through a TiO₂ Nanotube Membrane Used as a Thermal Barrier Coating*, K. Das, J. Whitcomb, D. Lagoudas

1:50 USNCTAM2010-1303: *A Peridynamic Formulation for Thermal Transport*, F. Bobaru, M. Duangpanya

2:15 USNCTAM2010-770: *Coupled Heat Conduction and Thermal Stress Analyses in Particulate Composites*, K. A. Khan, R. B. Barello, A. H. Muliana, M. Lévesque

Dynamics

5-4 Nonlinear Phenomena in Mechanical and Structural Systems

MB3 5-4-2 Nonlinear Phenomena in Parametrically Excited Systems

12:35 p.m. – 2:40 p.m., Senate 3

Organizers: A. J. Dick, B. Balachandran

Session Chairs: J. F. Rhoads, F. Feng

12:35 USNCTAM2010-468: *Qualitative Differences in Bifurcations of Averaged Equations for Parametrically Excited Duffing System*, F. Feng

1:00 USNCTAM2010-605: *Parametric Resonance-Based Piezoelectric Micro-Resonators: Design and Analysis*, P. Ghaderi, A. J. Dick

1:25 USNCTAM2010-1159: *Nonlinear Parametric Amplification and Attenuation in a Base-Excited Cantilever Beam*, V. Kumar, J. K. Miller, J. F. Rhoads

5-10 Dynamics and Stability of Human Movement Systems

MB4 5-10-2 Computational Modeling of Biodynamics

12:35 p.m. – 2:40 p.m., Senate 2

Organizers: M. Tanaka, J. Dingwell

Session Chairs: S. Ross, P. Roos

12:35 USNCTAM2010-1290: *Existence and Absence of Stable Locomotion of the Slip Model*, J. Seipel, J. H. Park

1:00 USNCTAM2010-857: *Walking with Compliant Legs: Robustness or Efficiency*, J. Rummel, A. Seyfarth

1:25 USNCTAM2010-773: *Does a Crouched Posture Enhance Running Stability?* Y. Blum, A. Birn-Jeffery, M. A. Daley, A. Seyfarth

1:50 USNCTAM2010-670: *Stability Analysis of a Balancing Controlled Biped During Standing via Lyapunov Exponents Calculated from a Time Series Using Nonlinear Mapping*, C. Yang, C. Q. Wu

2:15 USNCTAM2010-676: *Stability Analysis of a Balancing Controlled Biped During Standing via Lyapunov Exponents Calculated from a Noisy Time Series*, C. Yang, C. Q. Wu

Concurrent Sessions

Monday C, 2:55-5:00 p.m.

Computational Methods

MC203 1-2-3 Advanced Material Systems and Nondeterministic Methods

1-2 Computational Modeling of Multi-Scale/Multi-Physics Processes in Materials

2:55 p.m. – 5:00 p.m., Room 203

Organizers: W. K. Liu, F. Vernerey, E. Karpov

Session Chairs: D. Qian, F. Vernerey

2:55 **Keynote Presentation:** USNCTAM2010-729: *Non-deterministic Multiscale Modeling of Biomimetic Crack Self-Healing in Nanocrystalline Solids under Mechanical Loading*, E. Karpov, M. Grankin

3:45 USNCTAM2010-728: *Modeling and Simulation of Coupled Microstructure Fracture Evolution in Ferroelectric Materials*, A. A. Hosnijeh, I. Arias

4:10 USNCTAM2010-1166: *Finite Strain Micromorphic Elastoplasticity and Its Application to Multiscale Modeling of Localized Deformation in Bound and Unbound Particulate Materials*, R. Regueiro, V. Isubuga

4:35 USNCTAM2010-1415: *Atomic Scale Modeling of Multi-Component Interfaces in Metal-Matrix Nanocomposites*, A. M. Dongare, L. V. Zhigilei, D. L. Irving, A. M. Rajendran, M. M. Zikry, D. W. Brenner, B. LaMattina

1-4 Isogeometric Analysis

MC112 1-4-1 Isogeometric Analysis—I

2:55 p.m. – 5:00 p.m., Room 112

Organizers: Y. Zhang, Y. Bazilevs

Session Chair: Y. Zhang

2:55 USNCTAM2010-354: *A Large Deformation, Rotation-Free, Isogeometric Shell*, D. Benson, Y. Bazilevs, M.-C. Hsu, T. J. R. Hughes

3:20 USNCTAM2010-1167: *Fluid-Structure Interaction of Wind Turbines Using Isogeometric Analysis*, Y. Bazilevs, M.-C. Hsu

3:45 USNCTAM2010-712: *Towards Isogeometric Analysis and Design Optimization of Ship Propellers and Hydroelectric Turbine Blades*, B. Jüttler, M. Aigner, M. Kapl, E. Pilgerstorfer, M. Rossgatterer, U. Schwarzmaier, W. Zulehner

4:10 USNCTAM2010-1006: *NURBS-Based Isogeometric Contact Analysis*, J. Lu

Fluid Mechanics

2-3 High Reynolds Number Turbulence

MC205 2-3-3 Atmospheric Turbulent Flows

2:55 p.m. – 5:00 p.m., Room 205

Organizer: A. Smits

Session Chair: E. Bou-Zeid

2:55 USNCTAM2010-636: *Experimental and Numerical Investigations of Stably Stratified Atmospheric Flows*, E. Bou-Zeid, S. Shah, M. Parlange, A. Smits, C. Higgins, H. Huwald, C. Meneveau

3:20 USNCTAM2010-766: *Structure of a Thermally Stable Turbulent Boundary Layer*, O. Williams, S. C. C. Bailey, E. Bou-Zeid, A. Smits

3:45 USNCTAM2010-942: *Structure of Coherence in Neutral and Thermally Buoyant Atmospheric Surface Layers*, K. Chauhan, I. Marusic, N. Hutchins, J. Monty

4:10 USNCTAM2010-1399: *Predicting Law-of-the-Wall and the von Kármán Constant with LES*, J. Brasseur, T. Wei, S. Ramachandran

4:35 USNCTAM2010-873: *The Stagnation Point von Kármán Coefficient*, J. C. Vassilicos, V. Dallas, G. Hewitt

2-4 Cellular-Scale Hydrodynamics

MC211 2-4-1 Cellular-Scale Hydrodynamics—I

2:55 p.m. – 5:00 p.m., Room 211

Organizers: H. Stone, J. Wan

Session Chair: H. Stone

2:55 USNCTAM2010-408: *Microfluidic-Micromagnetic Separation of Blood Borne Pathogens in Whole Blood*, C. W. Yung, S. Tsai, R. M. Cooper, H. Le, V. deMeijer, H. Stone, M. Puder, D. E. Ingber

3:20 USNCTAM2010-663: *On-Demand Single-Cell Dispensing in a Microfluidic System for Microbeam Irradiation*, J. Xu, G. Garty, D. Brenner, D. Attinger

3:45 USNCTAM2010-1055: *High Frequency Deformability Activated Cell Enrichment Using Inertial Microfluidics*, S. C. Hur, D. Di Carlo

4:10 USNCTAM2010-1077: *The Hydrodynamics of Periodically Beating Artificial Cilia*, P. R. Onck, S. N. Khaderi, M. G. H. M. Baltussen, P. D. Anderson, J. M. J. den Toonder

4:35 USNCTAM2010-785: *Shape, Motility and Flow: Effects of Shear on the Motility of Bacteria*, M. Marcos, H. C. Fu, T. Powers, R. Stocker

Concurrent Sessions—Monday continued

2-6 Transport in Microscale and Laminar Flows

MC219 2-6-3 Transport in Microscale and Laminar Flows—III

2:55 p.m. – 5:00 p.m., Room 219

Organizers: N. Aubry, M. Stremler

Session Chairs: N. Aubry, M. Stremler

- 2:55 USNCTAM2010-336: *Modelling of T-Junction Generator Operating in the Transitional Regime: Defining the Fitting Parameters*, T. Glawdel, C. Elbuken, C. Ren
- 3:20 USNCTAM2010-638: *On the Prediction of Deposit Structures from Evaporating Droplet Containing Colloidal Particles: Influence of the pH and Proposition of a Phase Diagram*, R. Bhardwaj, X. Fang, P. Somasundaran, D. Attinger
- 3:45 USNCTAM2010-933: *Direct Numerical Simulation of Ferrofluid Drops in a Cylindrical Microfluidic under the Influence of a Non-Uniform Magnetic Field*, S. Afkhami, L. Cummings, Y. Renardy, M. Renardy
- 4:10 USNCTAM2010-1152: *Analysis of Electrostatic Forces on Sessile Drops During Electrowetting-on-Dielectric*, Y. Daneshbod, J. Sterling, A. Nadim
- 4:35 USNCTAM2010-1231: *Capillary-Based Liquid Micro/Nano Deposition*, A. Lutfurakhmanov, R. Sailer, G. Loken, A. Kohut, Y. Wang, A. Voronov, D. Schulz, I. Akhatov

Biomechanics

MC206 3-2-3 Characterization and Modeling of Biological Materials

3-2 Mechanics of Biological and Bioinspired Materials

2:55 p.m. – 5:00 p.m., Room 206

Organizer: I. Jasiuk

Session Chairs: M. Oyen, E. Cherkaev

- 2:55 USNCTAM2010-1313: *Nanoscale Visco(poro)elasticity of Native and Engineered Cartilage*, L. Han, B. B. Lee, J. Greene, E. Frank, H.-H. Hung, C. Ortiz, A. J. Grodzinsky
- 3:20 USNCTAM2010-1004: *Modeling of Biological Materials as Fibrous Networks*, Y. H. Lee, I. Jasiuk
- 3:45 USNCTAM2010-1261: *Mechanical Modeling of Wrinkled Fingertips Immersed in Water with Applications in Cosmetics Science*, J. Yin, X. Chen

- 4:10 USNCTAM2010-1292: *Bulge Test and Contact Study of Transparent Thin Films with Moiré Deflectometry*, D. Xu, K. Liechti
- 4:35 USNCTAM2010-484: *A Novel Approach for Modeling Mechanical Behavior of Porous Media*, B. Altan

3-6 Molecular and Cellular Biomechanics: Adhesion, Cell-ECM Interaction, and Mechanotransduction

MC208 3-6-2 Cytoskeletal Mechanics

2:55 p.m. – 5:00 p.m., Room 208

Organizers: S. Zhang, G. Bao, H. Gao, K. J. Hsia, J. Li, K. Grosh

Session Chair: T. Li

- 2:55 **Keynote Presentation:** USNCTAM2010-697: *In Silico Structure Prediction and Nanomechanics of Intermediate Filaments*, M. J. Buehler, Z. Qin, L. Kreplak
- 3:45 USNCTAM2010-517: *Mechanics of Heterogeneous Fluctuating Elastic Rods*, T. Su, P. Purohit
- 4:10 USNCTAM2010-929: *A Microscopic Formulation of the Motion of Actin-Driven Listeria*, Y. Lin, V. Shenoy
- 4:35 USNCTAM2010-1104: *Mechanics of Microtubule Buckling in Living Cells*, Teng Li

Mechanics of Materials and Structures

4-2 Dynamic Response of Materials

MC218 4-2-3 Dynamic Response of Materials—III

2:55 p.m. – 5:00 p.m., Room 218

Organizers: K. Ravi-Chandar, G. Subhash, P. H. Geubelle

Session Chair: K. T. Ramesh

- 2:55 USNCTAM2010-1327: *Change in Rate-Controlling Mechanism of Plastic Flow at High Temperatures and High Strain Rates*, S. E. Grunsel, R. J. Clifton, T. Jiao
- 3:20 USNCTAM2010-1359: *Experimental Investigation of the Effect of Temperature and Strain Rate on the Phase Transformation in 301LN Stainless Steel Sheets under Shear Loading*, D. Mohr, A. Beese, I. Negreanu, G. Gary, P.-O. Santacreu
- 3:45 USNCTAM2010-1023: *Dynamic Delamination of Thin Films Using a Laser-Induced Acoustic Pulse*, P. Selvarasu, P. Tran, M. Grady, P. H. Geubelle, N. R. Sottos
- 4:10 USNCTAM2010-1401: *Dynamic Delamination of a Polymer Coating from a Metal Substrate*, A. Albrecht, K. Liechti, K. Ravi-Chandar

Concurrent Sessions—Monday continued

4-4 Mechanics of Crystalline Nanostructures

MC207 4-4-1 Carbon-Based Nanostructures

2:55 p.m. – 5:00 p.m., Room 207

Organizers: H. Park, H. D. Espinosa

Session Chair: R. Huang

- 2:55 USNCTAM2010-983: *A Foliation Continuum Model for Multiwalled Carbon Nanotubes*, S. Ghosh, M. Arroyo
- 3:20 USNCTAM2010-1340: *Helical Nanotube Structures of MoS₂ with Chirality-Dependent Properties*, T. Dumitrica, D.-B. Zhang
- 3:45 USNCTAM2010-1101: *Graphene Morphology Regulated by Nanowires Patterned on a Substrate Surface*, Z. Zhang, T. Li
- 4:10 USNCTAM2010-808: *First-Principles Calculation of Elastic Property of Two-Dimensional Crystal Monolayers*, S. Jun
- 4:35 USNCTAM2010-601: *Nonlinear Mechanics of Graphene Nanoribbons*, Q. Lu, R. Huang

4-7 Structural Health Monitoring

MC108 4-7-6 Celebration of Joseph Rose's Accomplishments in Ultrasonics—III

2:55 p.m. – 5:00 p.m., Room 108

Organizers: C. Lissenden, D. E. Adams

Session Chair: J. Popovics

- 2:55 USNCTAM2010-466: *Higher Order Harmonics and Their Applications in Nondestructive Damage Assessment in Metallic Materials*, J.-Y. Kim, L. Jacobs, J. Qu
- 3:20 USNCTAM2010-630: *Ultrasonic Sensors for Harsh Environments*, B. R. Tittmann, M. J. Guers, C. Searfass, D. Parks
- 3:45 USNCTAM2010-840: *Guided Wave Active and Synthetic Focusing Techniques in Pipe Inspection*, J. Mu, L. Zhang
- 4:10 USNCTAM2010-1375: *Simulation and Testing of Ultrasonic Guided Waves for PZT Based Sensing of Structural Components and Damage Detection*, A. Mal, F. Ricci, E. Monaco, L. Lecce, S. Tancredi, S. Banerjee
- 4:35 USNCTAM2010-1377: *Theoretically Driven Parameter Selection for Ultrasonic Guided Wave Inspection of Adhesive Bonding*, P. Puthillath, C. Lissenden, J. L. Rose

4-9 Non-Local and Strain Gradient Elasticity, Viscoelasticity, and Plasticity

MC104 4-9-4 Non-Local and Strain Gradient—III

2:55 p.m. – 5:00 p.m., Room 104

Organizers: R. K. Abu Al-Rub, X.-L. Gao

Session Chairs: X.-L. Gao, K. Lazopoulos

- 2:55 USNCTAM2010-831: *Multi-Displacement Continuum Modeling of a 2D Metacomposite*, H.-H. Huang, C. T. Sun
- 3:20 USNCTAM2010-655: *Micro-Indentation of Elasto-Viscoplastic Solids*, K. Danas, V. Deshpande, N. Fleck
- 3:45 USNCTAM2010-772: *Effects of Stress Concentrations on the Attenuation by Diffusionally-Assisted Grain Boundary Sliding*, L. C. Lee, S. Morris, J. Wilkening, T. Zohdi
- 4:10 USNCTAM2010-1347: *On the Calibration of Fretting Fatigue Tests for Complete Contacts Using Asymptotic Techniques*, D. A. Hills, D. Dini, R. J. H. Paynter, S. Reina

4-12 Mechanics of Low-Dimensional Carbon Materials

MC105 4-12-3 Buckling of Multi-Walled Carbon Nanotubes

2:55 p.m. – 5:00 p.m., Room 105

Organizers: S. Zhang, V. Shenoy, J. Huang, A. To

Session Chair: S. Terdalkar

- 2:55 USNCTAM2010-629: *An Elastica Model that Describes the Buckling of Cross-Sections of Multi-Walled Nanotubes*, J. P. Wilber, J. Leta
- 3:20 USNCTAM2010-726: *Comparison between Linear Thin Shells and an Atomistic-Based Model for Buckling of MWCNTs under Hydrostatic Pressure*, M. Rahimi, M. Arroyo, H. Shima, M. Sato
- 3:45 USNCTAM2010-941: *Role of the Interlayer Interactions in the Mechanical Deformations of Carbon Nanotubes*, O. ShklyaeV, V. Crespi, E. Mockensturm
- 4:10 USNCTAM2010-1203: *Load-Driven Morphological Evolution in Covalently Bridged Multi-Walled Carbon Nanotubes*, X. Huang, S. Zhang
- 4:35 USNCTAM2010-716: *Thermomechanical Behavior of Micrometer-Long Carbon Nanotube*, Y. Fu, M. Kirca, A. To

Concurrent Sessions—*Monday continued*

4-16 Macroscopic Properties and Instabilities in Heterogeneous Materials Systems

MC106 4-16-3 Macroscopic Properties and Instabilities in Composite Materials and Polycrystals

2:55 p.m. – 5:00 p.m., Room 106

Organizers: O. Lopez-Pamies, P. Ponte Castaneda

Session Chairs: S. Joshi, O. Lopez-Pamies

- 2:55 USNCTAM2010-882: *Stability Map for Nanostructured and Amorphous Materials*, S. Joshi, K. T. Ramesh
- 3:20 USNCTAM2010-1162: *Design Parameters in Controlling the Finite Deformation Response of Multilayered Polyurethane-Montmorillonite Nanocomposites*, A. Kaushik, M. Yang, P. Podsiadlo, A. Waas, N. Kotov, E. Arruda
- 3:45 USNCTAM2010-877: *Analytical and Numerical Study of the Macroscopic Stability of Fiber Composites with Gent Phases*, S. Rudykh, G. deBotton
- 4:10 USNCTAM2010-1046: *Variational Asymptotic Homogenization and Dimensional Reduction of Heterogeneous Plates*, C.-Y. Lee, W. Yu
- 4:35 USNCTAM2010-813: *Macroscopic Failure of Fiber-Reinforced Elastomers under 3-D Finite Strains*, M. Agoras, O. Lopez-Pamies, P. Ponte Castaneda

4-17 Instability of Solids and Structures

MC1 4-17-3 Instability of Solids and Structures—III

2:55 p.m. – 5:00 p.m., Deans Hall 1

Organizers: S. Kyriakides, T. Healey, N. Triantafyllidis

Session Chairs: S. Kyriakides, D. Mohr

- 2:55 USNCTAM2010-461: *Effect of Lüders Bands on the Response and Stability of Steel Tubes under Bending*, J. F. Hallai, S. Kyriakides
- 3:20 USNCTAM2010-943: *Elastoplastic Buckling of Circular Cylindrical Shells under Combined Axial Force and Hydrostatic Pressure*, A. Schneiderman, D. Durban
- 3:45 USNCTAM2010-463: *Effects of Material Anisotropy on the Buckling Behaviour of High Strength Steel Pipelines*, A. Fathi, R. Cheng, S. Adeeb
- 4:10 USNCTAM2010-552: *Buckling of Thin Cylindrical Shells under Combined Loads: Bending, Compression and Internal Pressure*, A. Da Silva, A. Limam, F. Lorrioux, V. Taponier
- 4:35 USNCTAM2010-1305: *Martensitic Transformation in 301LN Stainless Steel Sheets under In-Plane Compression, Tension and Shear*, A. Beese, D. Mohr

4-22 Mechanics of Energy Storage

MC2 4-22-2 Mechanics of Energy Storage—II

2:55 p.m. – 5:00 p.m., Deans Hall 2

Organizers: R. McMeeking, M. Kamlah, P. Sofronis

Session Chair: R. McMeeking

- 2:55 **Keynote Presentation:** USNCTAM2010-1175: *Some Mechanical Considerations Associated with Li-Ion Batteries*, M. Dunn, K. Maute, S. Golmon
- 3:45 USNCTAM2010-628: *Models for Transport and Stress Generation in Li-Ion Batteries Electrodes: Electrolyte, Interfaces and Storage Particles*, R. McMeeking
- 4:10 USNCTAM2010-1132: *Observations of Mechanical Effects in Electrode Materials for Li-Ion Batteries*, R. Moenig, D. Chen, A. Sedlmayr, M. Kamlah, O. Kraft
- 4:35 USNCTAM2010-1394: *The Origins of the “Dead-Layer” in High Energy Storage Density Nanocapacitors*, P. Sharma, M. Majdoub, R. Maranganti

4-24 Multiscale Modeling of Progressive Failure in Fiber Reinforced Composites

MC109 4-24-3 Multiscale Modeling of Progressive Failure in Composites—III

2:55 p.m. – 5:00 p.m., Room 109

Organizers: A. Waas, B. Bednarczyk, S. Arnold

Session Chair: A. Waas

- 2:55 USNCTAM2010-1386: *Inelastic Multiscale Modeling of Woven Fabric Composites*, K. Liu, A. Chattopadhyay
- 3:20 USNCTAM2010-448: *Modeling Failure of Fiber Reinforced Composites Due to Evolving Microcracks Using a Two-Way Coupled Multiscale Model*, F. Souza, D. Allen
- 3:45 USNCTAM2010-1310: *Multiscale Modeling of Progressive Microdamage and Transverse Cracking in Fiber Reinforced Laminates*, E. Pineda, A. Waas, B. Bednarczyk, C. Collier
- 4:10 USNCTAM2010-994: *Micromechanically Based Multiscale Material Modeling of Polymer Composites with Arbitrary Coated Nanoreinforcements*, J. Yu, J. Lee

Concurrent Sessions—*Monday continued*

Dynamics

5-4 Nonlinear Phenomena in Mechanical and Structural Systems

MC3 5-4-3 Analytical and Computational Investigations into Nonlinear Phenomena—I

2:55 p.m. – 5:00 p.m., Senate 3

Organizers: A. J. Dick, B. Balachandran

Session Chairs: I. E. Douglas, A. V. Doroshin

- 2:55 USNCTAM2010-674: *Effect of Noise on the Dynamics of an Elastic Structure with Nonlinear Tip-Interaction Forces*, I. Chakraborty, S. Ramakrishnan, B. Balachandran
- 3:20 USNCTAM2010-1088: *Effect of Stochasticity on Targeted Energy Transfer from a Linear Medium to a Strongly Nonlinear Attachment*, T. Sapsis, A. Vakakis, L. Bergman
- 3:45 USNCTAM2010-1334: *Analytical Procedure for Development of Ship Motion Stability Criteria*, I. E. Douglas
- 4:10 USNCTAM2010-660: *Perturbed Chaotic Motion of Spider-Type Multibody System*, A. V. Doroshin
- 4:35 USNCTAM2010-661: *Chaotic Motion of Free Gyrostat with Asymmetric Rotor*, A. V. Doroshin, V. S. Aslanov

5-10 Dynamics and Stability of Human Movement Systems

MC4 5-10-3 Complex Dynamics of Walking and Running

2:55 p.m. – 5:00 p.m., Senate 2

Organizers: M. Tanaka, J. Dingwell

Session Chairs: J. Dingwell, P. Tallapragada

- 2:55 USNCTAM2010-858: *Characterization of Spatiotemporally Complex and Coupled Gait Patterns Using Cross-Correlation*, K. Park, H. Dankowicz, E. T. Hsiao-Wecksler
- 3:20 USNCTAM2010-1147: *Machine Learning Techniques for Classifying Human Gait*, L. C. Trutoiu, J. S. Brach, J. K. Hodgins, M. Redfern
- 3:45 USNCTAM2010-1322: *Complex Modal Analysis of Human Walking and Running*, B. Rutledge, K. Friederichs, T. Reid-Bush, B. Feeny
- 4:10 USNCTAM2010-918: *Exploiting Redundancy to Control Step Variability in Human Treadmill Walking: Experiments and Modeling*, J. Dingwell, J. John, J. Cusumano
- 4:35 USNCTAM2010-934: *Effect of Excessive Adiposity on Local Dynamic Stability*, J. Liu

CONCURRENT SESSIONS

Tuesday, June 29

Concurrent Sessions

Tuesday A, 9:15 – 11:20 a.m.

Computational Methods

1-2 Computational Modeling of Multi-Scale/Multi-Physics Processes in Materials

TA203 1-2-4 Electronic Effects and Quantum Systems

9:15 a.m. – 11:20 a.m., Room 203

Organizers: W. K. Liu, F. Vernerey, E. Karpov

Session Chairs: E. Karpov, S. Gonella

9:15 USNCTAM2010-937: *A Concurrent Approach to Electron-Mechanical Coupling in Nanocrystallines*, D. Qian

9:40 USNCTAM2010-681: *Multiscale Approach for Quantum Systems*, J. S. Chen, W. Hu

10:05 USNCTAM2010-799: *Magnetoelectric Effects in Multiferroic Composites*, R. Wang, E. Pan

10:30 USNCTAM2010-409: *Estimating the Response Time of Electrostatic MEMS Switches*, S. Nelatury, O. Onipede Jr, R. Gray

10:55 USNCTAM2010-1255: *Modeling the Onset of Electrical Percolation in Polymer Nanocomposites*, L. Berhan, A. Belashi

1-4 Isogeometric Analysis

TA112 1-4-2 Isogeometric Analysis—II

9:15 a.m. – 11:20 a.m., Room 112

Organizers: Y. Zhang, Y. Bazilevs

Session Chair: Y. Zhang

9:15 USNCTAM2010-838: *Unified Geometric Model of Elastic Rods and Viscous Threads*, M. Bergou, B. Audoly, M. Wardetzky, E. Vouga, E. Grinspun,

9:40 USNCTAM2010-1406: *Explicit Geometrical Modeling of Void Evolution under an Electrical Field*, K. Mysore, G. Subbarayan

10:05 USNCTAM2010-518: *Adaptive Finite Element Methods for Elliptic PDEs over Hierarchical T-Meshes*, L. Tian, F. Chen, Q. Du

10:30 USNCTAM2010-1207: *High-Order Immersed Boundary Methods*, R. Rangarajan, A. J. Lew

Fluid Mechanics

2-3 High Reynolds Number Turbulence

TA205 2-3-4 Turbulence Theory

9:15 a.m. – 11:20 a.m., Room 205

Organizer: A. Smits

Session Chair: L. R. Collins

9:15 USNCTAM2010-650: *Turbulence and Vortex Dynamics*, P. Orlandi, S. Pirozzoli

9:40 USNCTAM2010-803: *New Turbulent Scaling Laws Arising from New Statistical Symmetries of the Multi-Point Equations*, A. M. Rosteck, M. Oberlack, G. Khujadze

10:05 USNCTAM2010-826: *DNS and Scaling Laws of Turbulence Generated by a Vibrating Grid*, G. Khujadze, M. Oberlack

10:30 USNCTAM2010-1201: *Lagrangian Statistics of Velocity Gradients at High Reynolds Number*, P. Yeung

10:55 USNCTAM2010-1235: *Velocity Structure Functions for Particle-Laden Homogeneous Isotropic Turbulence at Low and Moderate Reynolds Numbers*, J. P. L. C. Salazar, L. R. Collins

2-4 Cellular-Scale Hydrodynamics

TA211 2-4-2 Cellular-Scale Hydrodynamics—II

9:15 a.m. – 11:20 a.m., Room 211

Organizers: H. A. Stone, J. Wan

Session Chair: H. A. Stone

9:15 USNCTAM2010-740: *Transport of Leukocytes by Red Cells in Model Microvessels*, J. Freund

9:40 USNCTAM2010-1308: *Multiscale Modeling of Blood Flow in Cerebral Malaria*, G. Karniadakis, D. Fedosov, B. Caswell

10:05 USNCTAM2010-1179: *Relaxation Dynamics of Fluid Membranes*, M. Arroyo, A. DeSimone, L. Heltai

2-6 Transport in Microscale and Laminar Flows

TA219 2-6-4 Transport in Microscale and Laminar Flows—IV

9:15 a.m. – 11:20 a.m., Room 219

Organizers: N. Aubry, M. Stremler

Session Chairs: N. Aubry, M. Stremler

Concurrent Sessions—Tuesday continued

- 9:15 USNCTAM2010-762: *Interfacial Temperature Measurements, High-Speed Visualization and Finite-Element Simulations of Droplet Impact and Evaporation on a Solid Surface*, R. Bhardwaj, J. Longtin, D. Attinger
- 9:40 USNCTAM2010-997: *Aerosol Flow in Microscale: Theory, Experiment, and Application to Direct-Write Micro Fabrication*, J. Hoey, A. Lutfurakhmanov, J. Daug, Z. Mahmud, O. Swenson, D. Schulz, I. Akhatov
- 10:05 USNCTAM2010-1222: *Resonance Phenomena and Long-Term Chaotic Advection in Stokes Flows*, D. Vainchtein, A. Abudu, R. Grigoriev

Biomechanics

TA206 3-2-4 Molecular Models of Biological Systems

3-2 Mechanics of Biological and Bioinspired Materials

9:15 a.m. – 11:20 a.m., Room 206

Organizer: I. Jasiuk

Session Chairs: P. R. Onck, V. Tomar

- 9:15 USNCTAM2010-416: *Nanomechanics of Tropocollagen and Hydroxyapatite Biomaterials with an Account of Collagen Mutations and Varied Hydroxyapatite Textures*, D. Dubey, V. Tomar
- 9:40 USNCTAM2010-666: *A Two-Filament Model of Flagella with Sliding-Controlled Activation of Dynein Motor Proteins*, S. Chatterjee, S. N. Khaderi, P. R. Onck
- 10:05 USNCTAM2010-930: *Conformation of Polymer Molecules Grafted on a Substrate*, Y. Lin, L. B. Freund
- 10:30 USNCTAM2010-1068: *Moving Interfaces in Rod-Like Macromolecules*, R. Raj, P. Purohit
- 10:55 USNCTAM2010-1123: *Coarse-Grained Molecular Dynamics Simulations of DNA-Carbon Nanotube Interactions*, W. Liang, J. Zou, S. Zhang

3-6 Molecular and Cellular Biomechanics: Adhesion, Cell-ECM Interaction, and Mechanotransduction

TA208 3-6-3 Single-Cell Mechanics

9:15 a.m. – 11:20 a.m., Room 208

Organizers: S. Zhang, G. Bao, H. Gao, K. J. Hsia, J. Li, K. Grosh

Session Chair: S. Zhang

- 9:15 USNCTAM2010-617: *Penetration Mechanics of Mucin Brushes on Cancer Cell Surface by Spherical Drug-Delivery Microcapsules*, X. Wang, A. Shah, R. Campbell, K. Wan
- 9:40 USNCTAM2010-627: *Nanofountain Probes for Single Cell Studies*, H. D. Espinosa, O. Y. Loh
- 10:05 USNCTAM2010-955: *Modeling the Forced Detachment of Cells*, T. Nguyen, T. Zhu
- 10:30 USNCTAM2010-1220: *Investigation of the Mechanics of Single-Cell Adhesion Strength Using a Microfluidic Probe*, K. T. Turner, K. V. Christ
- 10:55 USNCTAM2010-1268: *The Stokesian Fluid Stimulus Probe: A Novel and Quantifiable Force Probe for the Application of Piconewton Level Forces*, D. Wu, P. Ganatos, D. C. Spray, S. Weinbaum

Mechanics of Materials and Structures

4-2 Dynamic Response of Materials

TA218 4-2-4 Dynamic Response of Materials—IV

9:15 a.m. – 11:20 a.m., Room 218

Organizers: K. Ravi-Chandar, G. Subhash, P. H. Geubelle

Session Chair: K. Ravi-Chandar

- 9:15 USNCTAM2010-985: *Stress-Wave Propagation with Negative Phase Velocity*, A. V. Amirkhizi, S. Nemat-Nasser
- 9:40 USNCTAM2010-1416: *Dynamic Electromechanical Behaviour of Interacting Piezoelectric Actuators*, S. A. Meguid, X. D. Wang
- 10:05 USNCTAM2010-1417: *Crack Identification Using Reverse Elastic Waves*, X. D. Wang, G. Huang
- 10:30 USNCTAM2010-657: *Optimal Design of a Simply Supported One-Way RC Slab Against Blast Loads Based on the Energy Approach*, W. Sun
- 10:55 USNCTAM2010-1067: *Elastodynamic Solutions for an Annular Load on a Transversely Isotropic Half-Space*, A. Ardeshtir-Behrestaghi, M. Eskandari-Ghadi, F. Shirzad

4-4 Mechanics of Crystalline Nanostructures

TA207 4-4-2 Surface Stress—Experiments and Modeling

9:15 a.m. – 11:20 a.m., Room 207

Organizers: H. Park, H. D. Espinosa

Session Chair: D. Gianola

- 9:15 USNCTAM2010-364: *Fracture Mechanisms and Electromechanical Coupling in Semiconducting Nanowires*, H. D. Espinosa, R. Agrawal, B. Peng

Concurrent Sessions—Tuesday continued

- 9:40 USNCTAM2010-367: *Surface Stress on Rough Surfaces and Its Applications to Elastic Response and Reconstruction of Film*, Y. Wang, J. Weissmuller, H. Duan
- 10:05 USNCTAM2010-432: *A Computational Method for Modelling Size and Surface Effects in Crystalline Nanowires Based on Finite Elements and Quantum Mechanics*, J. Yvonnet, A. Mitrushchenkov, G. Chambaud
- 10:30 USNCTAM2010-485: *Interfacial Excess Energy, Excess Stress and Excess Strain in Crystalline Solids*, R. Dingreville, J. Qu
- 10:55 USNCTAM2010-496: *Incremental Deformation Theory for Modeling of Surface Stress Effects on Bending Behavior of Nanowires*, G. Huang, F. Song

4-6 Transforming Visualization of Microstructure into Simulation for Multi-Scale Mechanics

TA106 4-6-1 Transforming Visualization of Microstructure into Simulation for Multi-Scale Mechanics

9:15 a.m. – 11:20 a.m., Room 106

Organizers: O. Ochoa, D. Mollenhauer

Session Chairs: O. Ochoa, D. Mollenhauer

- 9:15 USNCTAM2010-479: *Image-Based Mechanics of Polycrystalline Microstructure Using Statistical Volume Elements (SVEs)*, M. A. S. Qidwai, D. Turner, A. Lewis, S. Niezgod, A. Geltmacher, S. Kalidindi
- 9:40 USNCTAM2010-612: *Mechanics of Lightweight Proppants: A Discrete Approach*, M. Kulkarni, O. Ochoa
- 10:05 USNCTAM2010-647: *Visualisation of 3-D Preform Tow Architecture Using Micro-CT Scanner*, L. P. Djukic, I. Herszberg, M. K. Bannister, D. Mollenhauer
- 10:30 USNCTAM2010-1136: *3D Modeling of a Thermoelastic Polycrystal Using an Image Based Fast Fourier Transform Method*, B. Anglin, R. Lebensohn, A. D. Rollett
- 10:55 USNCTAM2010-1244: *A Micromechanics Model for Interpenetrating Phase Composites*, M. Liu, X.-L. Gao

4-7 Structural Health Monitoring

TA108 4-7-7 Celebration of Joseph Rose's Accomplishments in Ultrasonics—IV

9:15 a.m. – 11:20 a.m., Room 108

Organizers: C. Lissenden, D. E. Adams

Session Chair: J. Qu

- 9:15 USNCTAM2010-498: *Piezoelectric Wafer Active Sensors for Structural Health Monitoring—State of the Art and Future Directions*, V. Giurgiutiu
- 9:40 USNCTAM2010-1076: *A Non-Contact Structural Health Monitoring System Through Laser Based Excitation and Sensing of Ultrasonic Guided Waves*, D. Dutta, H. Sohn, J. Y. Yang
- 10:05 USNCTAM2010-1323: *Ultrasonic Guided Waves for Large Area Structural Health Monitoring*, R. Royer, F. Yan, J. L. Rose
- 10:30 USNCTAM2010-439: *Guided Waves for In-Situ Monitoring of Specimens in Reactor Environments*, M. J. Guers, B. R. Tittmann
- 10:55 USNCTAM2010-1384: *Defect Detection in Composite Structures Using Guided Wave Phased Arrays*, J. P. Koduru, J. Rose

4-9 Non-Local and Strain Gradient Elasticity, Viscoelasticity, and Plasticity

TA104 4-9-5 Non-Local and Strain Gradient—IV

9:15 a.m. – 11:20 a.m., Room 104

Organizers: R. K. Abu Al-Rub, X.-L. Gao

Session Chairs: R. K. Abu Al-Rub, L. Liu

- 9:15 USNCTAM2010-522: *Singular Solutions in Micropolar Elasticity*, W. E. Warren, E. Byskov
- 9:40 USNCTAM2010-1171: *Remarks on the Eshelby Conjectures for Anisotropic Media*, L. Liu
- 10:05 USNCTAM2010-948: *Plane Strain of ideal Fibre-Reinforced Hyper-Elastic Solids Containing Fibres with Bending Stiffness*, K. Soldatos, M. Dagher
- 10:30 USNCTAM2010-870: *Length-Scale Dependent Response of Hierarchical Composites Using Enriched Polycrystal Plasticity*, R. Aghababaei, S. Joshi, J. Zhang

4-17 Instability of Solids and Structures

TA1 4-17-4 Instability of Solids and Structures—IV

9:15 a.m. – 11:20 a.m., Deans Hall 1

Organizers: S. Kyriakides, T. Healey, N. Triantafyllidis

Session Chairs: T. Healey, C. Coman

- 9:15 USNCTAM2010-564: *Modeling and Analysis of Two-Phase Lipid Bi-Layer Vesicles*, T. Healey
- 9:40 USNCTAM2010-536: *Novel Negative Poisson's Ratio Behavior Induced by an Elastic Instability*, K. Bertoldi, P. Reis, S. Willshaw, T. Mullin
- 10:05 USNCTAM2010-316: *Asymptotic Results for an Interactive Buckling Model*, C. Coman

Concurrent Sessions—Tuesday continued

- 10:30 USNCTAM2010-312: *Response of Axially Compressed Square Laminates Having a Rectangular Cut-Out*, A. Kumar
10:55 USNCTAM2010-551: *Interactive Buckling of Steel Cones Subjected to Axial Compression and External Pressure*, J. Blachut

4-19 Constitutive Modeling of Particulate Material Behavior

TA109 4-19-1 Constitutive Modeling of Particulate Material Behavior—I

9:15 a.m. – 11:20 a.m., Room 109

Organizer: A. Palomino

Session Chair: Tong Qiu

- 9:15 USNCTAM2010-1252: *Fabric Anisotropy of Granular Materials: A Microscale Modeling*, J. Yang, B. Dai
9:40 USNCTAM2010-735: *Impact Compressive Response of Dry and Moisture Sand*, B. Song, B. Martin, W. Chen, V. Luk
10:05 USNCTAM2010-580: *A Model for Natural Soils with the Dissipation of Locked Energy*, W. M. Yan
10:30 USNCTAM2010-1170: *Coupled SPH-DEM Method for Fluid-Solid Interaction in Saturated Granular Materials*, W. Chen, T. Qiu

4-22 Mechanics of Energy Storage

TA2 4-22-3 Mechanics of Energy Storage—III

9:15 a.m. – 11:20 a.m., Deans Hall 2

Organizers: R. McMeeking, M. Kamlah, P. Sofronis

Session Chair: P. Sofronis

- 9:15 **Keynote Presentation:** USNCTAM2010-957: *Hydrogen Embrittlement of Metals: Mechanics, Chemisorption, and Polyhedral Packing of Atoms*, S. Huang, D. McDowell, T. Zhu
10:05 USNCTAM2010-760: *Lightweight High Pressure Hydrogen Storage Tanks*, S. N. Shoukry, G. William, J. C. Prucz, T. H. Evans
10:30 USNCTAM2010-936: *Change the Kinetic Barrier of BH_2NH_2 Polymer Coupled with an External Framework*, Z. Huang, V. Crespi

Dynamics

5-4 Nonlinear Phenomena in Mechanical and Structural Systems

TA3 5-4-4 Analytical and Computational Investigations into Nonlinear Phenomena—II

9:15 a.m. – 11:20 a.m., Senate 3

Organizers: A. J. Dick, B. Balachandran

Session Chairs: S. Ross, K. D. Mease

- 9:15 USNCTAM2010-554: *Applying the Liapunov-Floquet Transformation to Periodic Delay Differential Equations Discretized by the Chebyshev Spectral Continuous Time Approximation*, E. Butcher, O. Bobrenkov
9:40 USNCTAM2010-1078: *Complete Bifurcation Analysis of a Pendulum with a Vibrating Support*, M. V. Zakrzhevsky, A. Klovov
10:05 USNCTAM2010-1079: *Global Nonlinear Dynamics: New Novel Concepts and Their Realization Based on the Method of Complete Bifurcation Groups*, M. V. Zakrzhevsky, I. T. Schukin, R. S. Smirnova, Dalgavpils V. Y. Yevstignejev, V. Y. Frolov, A. Klovov, E. P. Shilvan
10:30 USNCTAM2010-441: *Chaotic Motion of an Asymmetric Rigid Body under Biharmonic Moment*, V. S. Aslanov
10:55 USNCTAM2010-1227: *Invariant Manifold Structure in Optimal Control Problems*, K. D. Mease, E. Aykutlug

5-10 Dynamics and Stability of Human Movement Systems

TA4 5-10-4 External Influences on Human Stability

9:15 a.m. – 11:20 a.m., Senate 2

Organizers: M. Tanaka, J. Dingwell

Session Chairs: J. Gao, J. John

- 9:15 USNCTAM2010-791: *Amplitude Control of Human Postural Sway Using Achilles Tendon Vibration*, J. Milton, J. Gyorffy, J. L. Cabrera, T. Ohira
9:40 USNCTAM2010-1277: *A Comparison of the Effects of Visual-Scene Motion on Walking and Standing and the Role of Stability*, T. Kiemel, D. Logan, Y. Ivanenko, F. Lacquaniti, J. J. Jeka
10:05 USNCTAM2010-1246: *Locomotion Stability Adaptation to the Virtual Reality Induced Sensory Conflicts*, X. Zhang, T. Lockhart, J. Lach, E. Abdel-Rahman

Concurrent Sessions—Tuesday continued

- 10:30 USNCTAM2010-922: *Influence of Horizontal Oscillations of the Support Surface and Visual Field on the Dynamic Stability of Human Walking*, P. McAndrew, J. Dingwell, J. M. Wilken
- 10:55 USNCTAM2010-1333: *The TRiP, a Device for Timed Rapid Induced Perturbations During Treadmill Walking*, K. Meijer, R. Senden, P. Laeven, P. Willems, H. Savelberg

Concurrent Sessions

Tuesday B, 12:35 – 2:40 p.m.

Computational Methods

1-2 Computational Modeling of Multi-Scale/Multi-Physics Processes in Materials

TB203 1-2-5 Advanced Systems and Processes

12:35 p.m. – 2:40 p.m., Room 203

Organizers: W. K. Liu, F. Vernerey, E. Karpov

Session Chairs: F. Vernerey, S. Gonella

- 12:35 USNCTAM2010-497: *Mesoscale Modeling of Nuclear Fuel Microstructures*, R. Dingreville, L. Zhang, T. Bartel
- 1:00 USNCTAM2010-621: *Finite Element Analysis of Microstructure Evolution in Magnesium Friction Stir Spot Welds*, J. M. Simmons, D. J. Bammann, M. F. Horstemeyer, K. N. Solanki
- 1:25 USNCTAM2010-1217: *Analysis of Local Water Slamming on Deformable Hulls*, K. Das, R. C. Batra
- 1:50 USNCTAM2010-778: *Numerical and Physical Modeling of Near-Shore Wave-Soil Interactions*, Y. L. Young, H. Xiao, J. Prevost
- 2:15 USNCTAM2010-516: *On the Micro-Scale Modelling by Homogenization Schemes in Geomechanics*, S. Levasseur, F. Collin, R. Charlier, Q. Zhu, D. Kondo

1-4 Isogeometric Analysis

TB112 1-4-3 Isogeometric Analysis—III

12:35 p.m. – 2:40 p.m., Room 112

Organizers: Y. Zhang, Y. Bazilevs

Session Chair: Y. Zhang

- 12:35 USNCTAM2010-533: *Octree-Based Solid T-Spline Construction for Complicated Geometry*, W. Wang, Y. Zhang

- 1:00 USNCTAM2010-841: *Shape Optimization Using Isogeometric Analysis*, S. Lipton, L. Dedé, T. J. R. Hughes
- 1:25 USNCTAM2010-1030: *Structural Topology Optimization with Isogeometric Analysis in a Phase Field Approach*, L. Dedé, T. J. R. Hughes, S. Lipton, V. M. Calo
- 1:50 USNCTAM2010-1409: *Full Analytical Sensitivities in NURBS Based Isogeometric Shape Optimization*, X. Qian
- 2:15 USNCTAM2010-1385: *Effecting Topological Design Through Feature Sensitivity*, M. Rayasam, K. Mysore, G. Subbarayan

Fluid Mechanics

2-1 General

TB211 2-1-1 General Fluid Mechanics—I

12:35 p.m. – 2:40 p.m., Room 211

Organizer: J. Brasseur

Session Chair: K. Christensen

- 12:35 USNCTAM2010-1189: *Vortex Images in Intersecting Cylinder/Sphere Pairs via Successive-Image Theory*, D. Palaniappan
- 1:00 USNCTAM2010-507: *Modeling of Lossy Resonators in Thermoacoustic Systems with Non-Uniform Boundary Conditions*, K. Matveev, S. Jung
- 1:25 USNCTAM2010-878: *Verification of Ventilation Air Flux and Pressure Drops in Underground Subway Systems: Applied for Ferdousi Station, Tehran Subway*, S. Zakani, M. Mahdinia, R. Maddahian, B. Farhanieh
- 1:50 USNCTAM2010-1316: *Prediction of Solute Concentration in Wells Annuli Owing to Free Convection*, U. B Sathuvalli, P. R. Paslay
- 2:15 USNCTAM2010-696: *Rayleigh-Benard Convection in Nanofluids*, L. Hadji

2-3 High Reynolds Number Turbulence

TB205 2-3-5 Wall-Bounded Turbulent Flows

12:35 p.m. – 2:40 p.m., Room 205

Organizer: A. Smits

Session Chair: B. McKeon

- 12:35 USNCTAM2010-489: *Model of Turbulence Fluctuations in Wall-Bounded Flows*, M. H. Buschmann, M. Gad-el-Hak
- 1:00 USNCTAM2010-672: *A Critical Layer Model for Turbulent Pipe Flow*, B. McKeon, A. Sharma

Concurrent Sessions—*Tuesday continued*

- 1:25 USNCTAM2010-923: *Vorticity and Wall Pressure Correlations in a High Reynolds Number Turbulent Boundary Layer*, C. Morrill-Winter, P. Priyadarshana, M. Metzger, J. C. Klewicki
- 1:50 USNCTAM2010-907: *The Effects of Uncertainty on the Analysis of Mean Velocity Profiles in Wall-Bounded Turbulence*, T. A. Oliver, R. D. Moser

2-6 Transport in Microscale and Laminar Flows

TB219 2-6-5 Transport in Microscale and Laminar Flows—V

12:35 p.m. – 2:40 p.m., Room 219

Organizers: N. Aubry, M. Stremmer

Session Chair: N. Aubry, M. Stremmer

- 12:35 USNCTAM2010-721: *Steady Flow Through a Curved Tube with Wavy Walls*, S. Peterson
- 1:00 USNCTAM2010-818: *Enhancement of Micro-Mixing Utilizing Inertial Flows Around Microspheres in Channel Flow*, H. Amini, D. Di Carlo
- 1:25 USNCTAM2010-978: *Destabilizing Key Periodic Orbits for Complete Chaotic Mixing in an Electro-Osmotic Mixer*, R. Chabreyrie, D. Chang, C. Chandre, P. Singh, N. Aubry
- 1:50 USNCTAM2010-1232: *Almost-Invariant Sets and Topological Chaos in Laminar Flows*, M. Stremmer, S. Ross, P. Grover, P. Kumar

Biomechanics

3-2 Mechanics of Biological and Bioinspired Materials

TB206 3-2-5 Bioinspired Materials

12:35 p.m. – 2:40 p.m., Room 206

Organizer: I. Jasiuk

Session Chairs: G. Genin, I. Jasiuk

- 12:35 USNCTAM2010-1286: *Attachment of Dissimilar Materials: Lessons from the Human Body*, Y. Liu, S. Thomopoulos, V. Birman, J.-S. Li, C. Chen, G. Genin
- 1:00 USNCTAM2010-1234: *A Dimensional Analysis Framework for Designing Bio-Inspired Composite Materials Through Modeling and Experiments*, P. Zavattieri, J. Rim, A. L. Juster, H. D. Espinosa
- 1:25 USNCTAM2010-1258: *Mechanical Self-Assembly of 3D Microstructures: A New Microfabrication Method Inspired by Biological Systems*, J. Yin, X. Chen

3-6 Molecular and Cellular Biomechanics: Adhesion, Cell-ECM Interaction, and Mechanotransduction

TB208 3-6-4 Cell-ECM Interactions

12:35 p.m. – 2:40 p.m., Room 208

Organizers: S. Zhang, G. Bao, H. Gao, K. J. Hsia, J. Li, K. Grosh

Session Chair: S. Zhang

- 12:35 **Keynote Presentation:** USNCTAM2010-717: *Optimal Matrix Rigidity for Stress Fiber Polarization and Differentiation of Stem Cells*, D. Discher
- 1:25 USNCTAM2010-531: *Monitoring Dynamic Changes in Local Cell-Matrix Mechanical Environment*, S. C. Baxter, C. W. Wilson, J. W. Stone, C. J. Murphy, E. C. Goldsmith
- 1:50 USNCTAM2010-988: *A Model for Rigidity Sensing of Extracellular Matrix By Integrin Catch Bond*, J. Qian, F. Kong, C. Zhu
- 2:15 USNCTAM2010-1117: *A Mechanical Model of Actin Stress Fiber Formation and Substrate Elasticity Sensing in Adherent Cells*, S. Sun

Mechanics of Materials and Structures

TB207 4-4-3 Plasticity and Failure of Nanowires

4-4 Mechanics of Crystalline Nanostructures

12:35 p.m. – 2:40 p.m., Room 207

Organizers: H. Park, H. D. Espinosa

Session Chair: Y. Zhu

- 12:35 USNCTAM2010-319: *Mechanical Behavior of Vapor-Liquid-Solid Synthesized Silicon Nanowires*, F. Xu, Q. Qin, Y. Zhu
- 1:00 USNCTAM2010-333: *Size-Dependent Plasticity of Twinned Metal Nanowires from Atomistic Simulations*, F. Sansoz
- 1:25 USNCTAM2010-893: *Adhesion and Rupture of Gold Electrodes at Single-Atom Contacts*, H. Wang, Y. Leng
- 1:50 USNCTAM2010-1048: *First Principles-Based Investigations of the Failure Mechanisms of ZnO Nanowires: Comparisons to Buckingham Potential Predictions and Experiment*, R. Agrawal, J. T. Paci, H. D. Espinosa
- 2:15 USNCTAM2010-1095: *Size Effect on the Phase Transformation of In-21at%Ti Nanowires*, F. Phillips, D. Fang, D. Lagoudas

Concurrent Sessions—Tuesday continued

4-7 Structural Health Monitoring

TB108 4-7-1 Structural Health Monitoring—I

12:35 p.m. – 2:40 p.m., Room 108

Organizers: C. Lissenden, D. E. Adams

Session Chair: D. E. Adams

- 12:35 USNCTAM2010-1350: *Simulated Space-Time Failure Statistics for a New Coupled-Field Damage Model*, J. Cusumano, Q. Li, A. Roy, J. Pitt, S. G. Abaimov
- 1:00 USNCTAM2010-1197: *Determining a Proper Interrogation Signal for Use in a Nonlinear, Breathing Crack Detection Technique*, D. Johnson, K. W. Wang, J.-S. Kim
- 1:25 USNCTAM2010-548: *Smart Rodend with Embedded Wireless Load Sensing*, J. Loverich, M. Grissom, J. Szefi, S. Wenner, Z. Fuhrer
- 1:50 USNCTAM2010-1325: *Wireless Monitoring of Wind Turbine Blade Health*, K. Reichard, B. Forshey, E. Hughes, M. Turner
- 2:15 USNCTAM2010-550: *Structural Health Monitoring in Composite Materials Using Vibration Reciprocity Measurements*, B. Zwink, D. E. Adams, D. J. Koester

4-11 Damage and Failure of Composite Materials

TB104 4-11-1 Damage and Failure of Composite Materials—I

12:35 p.m. – 2:40 p.m., Room 104

Organizer: R. Talreja

Session Chair: R. Talreja

- 12:35 USNCTAM2010-708: *Failure Analysis of Composite Impeller Using ABAQUS*, J. Wang, M. Patil, N. Mueller
- 1:00 USNCTAM2010-903: *Delamination Modeling with Cohesive Elements*, P. J. Matthews, K. L. Koudela
- 1:25 USNCTAM2010-413: *Augmented-FEM for Nonlinearly Coupled Multiple Cracking in Laminated Composites*, X. Fang, Z. Zhou, Q. Yang
- 1:50 USNCTAM2010-658: *Simulation and Experimental Evaluation of Mixed Mode Delamination in Multidirectional CF/PEEK Laminates under Quasi-Static and Fatigue Loading*, P. Naghipour, M. Bartsch, J. Schneider, H. Voggenteiler
- 2:15 USNCTAM2010-755: *Progressive Damage Response of Hybrid Composite Laminates under Three-Point Short Beam Shear Loading at Cryogenic Temperatures*, M. Miura, Y. Shindo, T. Takeda, F. Narita

4-12 Mechanics of Low-Dimensional Carbon Materials

TB105 4-12-5 Mechanics and Thermodynamics of Various Carbon Structures

12:35 p.m. – 2:40 p.m., Room 105

Organizer: S. Zhang, V. Shenoy, J. Huang, A. To

Session Chair: M. Manoharan

- 12:35 USNCTAM2010-776: *Mechanical Properties of 5 nm Thick Glassy Carbon Thin Films*, M. Manoharan, H. K. Lee, R. Rajagopalan, H. Foley, A. Haque
- 1:00 USNCTAM2010-935: *Visco-Elastic Properties of Low-Dimensional Carbon Nanostructures and Their Relation to Damping*, D. Qian, Z. Zhou
- 1:25 USNCTAM2010-1270: *Energy Absorption and Actuation Through Water Sorption in Hydrophobic Carbon Nanopores*, L. Liu, X. Chen
- 1:50 USNCTAM2010-502: *Phonon Analysis of Carbon Nanotubes with Arbitrary Chirality Using Objective Structures*, K. Dayal, R. Elliott
- 2:15 USNCTAM2010-1146: *A Numerical Investigation of Graphene Sheet Stress-Strain Behaviour*, P. A. Kakavas, N. Anifantis, S. Georgatzinos, D. Katsareas

4-17 Instability of Solids and Structures

TB1 4-17-5 Instability of Solids and Structures—V

12:35 p.m. – 2:40 p.m., Deans Hall 1

Organizers: S. Kyriakides, T. Healey, N. Triantafyllidis

Session Chairs: H. Obrecht, S. Shrivastava

- 12:35 USNCTAM2010-469: *Buckling and Progressive Crushing of Laterally Loaded Honeycomb Panels*, A. Wilbert, W.-Y. Jang, S. Kyriakides
- 1:00 USNCTAM2010-1237: *Inhomogeneous Compaction Deformation in Open Cell Aluminum Foam*, K. Issen, D. Bryl, M. Ingraham
- 1:25 USNCTAM2010-524: *Elastic/Plastic Bifurcation Buckling of Core-Filled Square and Circular Tubular Columns*, S. Shrivastava
- 1:50 USNCTAM2010-1020: *Load-Carrying Efficiency of Hybrid Lattice Structures*, H. Obrecht, U. Reinicke, M. Walkowiak
- 2:15 USNCTAM2010-1002: *Numerical Framework for the Study of Pattern Formation in Gels: Buckling and Swelling*, M. Juha, D. C. Simkins Jr, R. Toomey

Concurrent Sessions—Tuesday continued

4-18 Mechanics of Random and Fractal Materials

TB106 4-18-1 Mechanics of Random Materials—I

12:35 p.m. – 2:40 p.m., Room 106

Organizer: M. Ostoja-Starzewski

Session Chair: M. Ostoja-Starzewski

12:35 **Keynote Presentation:** USNCTAM2010-349: *Random Field Models for Polycrystals and Two-Phase Microstructures*, M. D. Grigoriu

1:25 USNCTAM2010-476: *On Mesoscopic Probabilistic Modeling of Random Anisotropic Media under Material Symmetry Constraints*, J. Guilleminot, C. Soize

1:50 USNCTAM2010-1114: *Random Structure Quantification of Nanocrystalline Magnesium Matrix Composites*, A. Kontsos

2:15 USNCTAM2010-817: *A Stochastic Extended Finite Element Method for Modeling Random Heterogeneous Microstructures*, B. Hiriyur, H. Waisman, G. Deodatis

4-19 Constitutive Modeling of Particulate Material Behavior

TB109 4-19-2 Constitutive Modeling of Particulate Material Behavior—II

12:35 p.m. – 2:40 p.m., Room 109

Organizer: A. Palomino

Session Chair: A. Palomino

12:35 USNCTAM2010-452: *Extension of the Beam Theory for the Polymer Bio-Transducers with Low Aspect Ratios and Viscoelastic Characteristics*, P. Du, I.-K. Lin, H. Lu, X. Zhang

1:00 USNCTAM2010-573: *Effect of Porosity and Microballoon Wall Thickness Polydispersivity on the Elastic Properties of Syntactic Foams*, M. Aureli, M. Porfiri, N. Gupta

1:25 USNCTAM2010-911: *Multidimensional Probabilistic Elastic-Plastic Constitutive Simulation of Geomaterials*, K. Sett

1:50 USNCTAM2010-1236: *Influence of Constitutive Framework on Strain Localization Conditions in Porous Sandstone*, K. Issen, M. Ingraham, T. Dewers

4-25 Symposium Honoring Professor Robert M. McMeeking on the Occasion of His 60th Birthday

TB2 4-25-1 McMeeking—I

12:35 p.m. – 2:40 p.m., Deans Hall 2

Organizers: C. M. Landis, M. R. Begley

Session Chairs: C. M. Landis, M. R. Begley

12:35 USNCTAM2010-583: *Compressive Response of a Sandwich Plate Containing a Cracked Diamond Lattice*, N. Fleck

1:00 USNCTAM2010-385: *Analysis and Design Strategies for Active Tensegrity Structures*, H. Bart-Smith, K. Moored, T. Kemp, N. Houle

1:25 USNCTAM2010-614: *Penetration Mechanics of Armour Ceramics*, V. Deshpande, R. McMeeking

1:50 USNCTAM2010-1145: *Homogenization-Based Constitutive Models for Porous Ductile Solids: Theory and Finite-Element Simulations*, A. A. Benzerga, S. Keralavarma

2:15 USNCTAM2010-1299: *Microstructural Evolution and Its Effect on Plastic Flow and Strain Localization*, J. L. Bassani, H. Pan

4-30 Multiscale Mechanical Characterization and Modeling of Porous Materials

TB218 4-30-1 Multiscale Mechanical Characterization and Modeling of Porous Media—I

12:35 p.m. – 2:40 p.m., Room 218

Organizers: J. Andrade, H. M. Jennings

Session Chair: H. M. Jennings

12:35 USNCTAM2010-504: *On Micropolar Finite Element Analysis Using a Two-Scale Constitutive Model*, K. Yonten, M. Manzari

1:00 USNCTAM2010-856: *Strong Discontinuities in Partially Saturated Media at Failure*, F. Armero, C. Callari

1:25 USNCTAM2010-909: *Multiscale Computations for the Prediction of Shear Bands in Granular Materials*, J. Andrade, C. Avila

1:50 USNCTAM2010-951: *Modeling Post-Localization Behavior in Granular Materials Using a Multi-Scale Strong Discontinuity Approach*, Q. Chen, J. Andrade

Concurrent Sessions—*Tuesday continued*

Dynamics

5-4 Nonlinear Phenomena in Mechanical and Structural Systems

TB3 5-4-5 Analytical and Computational Investigations into Nonlinear Phenomena—III

12:35 p.m. – 2:40 p.m., Senate 3

Organizers: A. J. Dick, B. Balachandran

Session Chairs: I. Georgiou, M. Tanveer

- 12:35 **Keynote Presentation:** USNCTAM2010-1274: *POD Characterization of Free Coupled Nonlinear Vibrations in an Aluminum Beam Structure*, I. Georgiou
- 1:25 USNCTAM2010-815: *Size Dependence of Strength and a Model Reduction Method for Frictional Dynamical Systems Failing at Multiple Length Scales*, A. Elbanna, T. Heaton
- 1:50 USNCTAM2010-807: *Mixed P-Type Method for the Nonlinear Transient Vibration Analysis of Almost Incompressible Axisymmetric Hyperelastic Solids*, M. Tanveer, J. W. Zu
- 2:15 USNCTAM2010-509: *Analysis of Transient Beam Behavior with Impact*, E. K. Ervin, W. Xu

5-10 Dynamics and Stability of Human Movement Systems

TB4 5-10-5 Neuromuscular Control of Movement

12:35 p.m. – 2:40 p.m., Senate 2

Organizers: M. Tanaka, J. Dingwell

Session Chairs: J. Milton, T. Kiemel

- 12:35 USNCTAM2010-532: *Use of Dynamics in Medical Research: Effect of Deep Brain Stimulation on Gait in Parkinson's Disease Patients*, M. Tanaka, M. Siddiqui, B. Long
- 1:00 USNCTAM2010-889: *Seated Postural Control Dynamics in Young Adults with Spinal Cord Injury*, S. Shin
- 1:25 USNCTAM2010-1009: *Long-Range Temporal Correlations, Multifractality, and the Causal Relation between Neural Inputs and Movements*, J. Gao
- 1:50 USNCTAM2010-1328: *The Effects of Noise on the Control of a Planar Model of Reaching*, H. Nguyen, J. Dingwell
- 2:15 USNCTAM2010-1199: *Stability and Variability Generation in Inter-Trial Task Dynamics*, J. Cusumano, J. John

Concurrent Sessions

Tuesday C, 2:55 – 5:00 p.m.

Computational Methods

1-3 Numerical and Analytical Methods in Mechanics of Solids

TC203 1-3-2 Numerical and Analytical Methods in Mechanics of Solids—I

2:55 p.m. – 5:00 p.m., Room 203

Organizer: E. S. Ventsel

Session Chair: Z. Bazant

- 2:55 USNCTAM2010-414: *An Improved Cohesive Element for Shell Delamination Analyses*, X. Fang, Q. Yang, J. Shi, J. Lua
- 3:20 USNCTAM2010-631: *A Nodal Position Finite Element Method for 2D Elastic Problems*, G. Zhu, B. H. Pour
- 3:45 USNCTAM2010-757: *The Three-Dimensional Beam Theory Based on Quaternion Algebra*, E. Zupan, M. Saje, D. Zupan
- 4:10 USNCTAM2010-913: *Accurate Coupling Methods for Mesh-Free and Finite Element Discretizations of Transient Nonlinear Problems in Solid Mechanics*, A. Prakash

1-4 Isogeometric Analysis

TC112 1-4-4 Isogeometric Analysis—IV

2:55 p.m. – 5:00 p.m., Room 112

Organizers: Y. Zhang, Y. Bazilevs

Session Chair: Y. Zhang

- 2:55 USNCTAM2010-960: *Discrete Ricci Flow for Geometric Modeling*, D. Gu
- 3:20 USNCTAM2010-356: *Delaunay Mesh Generation for Piecewise Smooth Domains*, T. Dey
- 3:45 USNCTAM2010-400: *Local Orthogonal Cutting Method for Computing Medial Curves and Its Biomedical Applications*, X. Jiao, D. R. Einstein, V. Deydov
- 4:10 USNCTAM2010-534: *Insight on the Correlation between Geometry, Mesh Quality Improvement, and Elliptic PDE Solution*, J. Kim, S. P. Sastry, S. M. Shontz
- 4:35 USNCTAM2010-1208: *Adaptive Mesh Refinement for Modeling the Electrical Wave Propagation in the Heart*, W. Ying

Concurrent Sessions—*Tuesday continued*

Fluid Mechanics

2-1 General

TC109 2-1-2 General Fluid Mechanics—II

2:55 p.m. – 5:00 p.m., Room 109

Organizer: J. Brasseur

Session Chair: K. Matveev

- 2:55 USNCTAM2010-572: *The Structure of Flow over Interacting Barchan Dunes*, J. Palmer, R. Mejia-Alvarez, J. Best, K. Christensen
- 3:20 USNCTAM2010-1141: *An Initial Study to Determine a Friction-Factor Model for Ground Vegetation*, P. Kenney, T. Keith
- 3:45 USNCTAM2010-570: *An Experimental Study of Heated Circular and Rectangular Jets Emitting into a Crossflow*, B. Johnson, G. Elliott, K. Christensen
- 4:10 USNCTAM2010-816: *A Numerical Investigation of 3-D Vortex Ring with Swirl*, J. Lou
- 4:35 USNCTAM2010-1130: *Dynamic Properties of Micropipette Vibration in a Viscous Fluid During ICSI*, M. Karzar-Jeddi, N. Olgac, T.-H. Fan

2-2 Non-Classical Turbulence Physics

TC211 2-2-2 Non-Classical Turbulence Physics—II

2:55 p.m. – 5:00 p.m., Room 211

Organizer: J. Brasseur

Session Chair: J. Brasseur

- 2:55 USNCTAM2010-659: *Flow Physics of Turbulent and Transitional Rough Channels*, P. Orlandi
- 3:20 USNCTAM2010-1131: *Behavior of Local Dissipation Scales in Turbulent Pipe Flow*, S. C. C. Bailey, M. Hultmark, A. Smits, J. Schumacher, V. Yakhot
- 3:45 USNCTAM2010-792: *Dependence of Different Measures of Passive Scalar Internal Intermittency on the Scalar Injection Mechanism*, J. Lepore, L. Mydlarski
- 4:10 USNCTAM2010-1318: *On the Intermittency of Dissipation Rates in High-Resolution Simulations of Turbulent Mixing*, P. Yeung, K. R. Sreenivasan, D. A. Donzis
- 4:35 USNCTAM2010-864: *A Hybrid Approach for Direct Numerical Simulation of Isotropic Compressible Turbulence*, S. Chen, J. Wang, Y. Shi, Z. Xiao, L.-P. Wang

2-3 High Reynolds Number Turbulence

TC205 2-3-6 Free Shear Flows and Transition

2:55 p.m. – 5:00 p.m., Room 205

Organizer: A. Smits

Session Chair: R. Ebner

- 2:55 USNCTAM2010-963: *Mean Dynamics of Boundary Layer Transition*, R. Ebner, X. Wu, J. C. Klewicki
- 3:20 USNCTAM2010-812: *Correlation Scales in a Single Stream Shear Layer*, S. Morris, J. F. Foss, M. Ross
- 3:45 USNCTAM2010-1276: *Response in Vortex-Induced Vibration*, O. Ahmad

2-9 Mechanics of Locomotion in Fluids

TC219 2-9-1 Microorganisms—I

2:55 p.m. – 5:00 p.m., Room 219

Organizer: S. Alben

Session Chair: T. Powers

- 2:55 **Keynote Presentation:** USNCTAM2010-669: *Collective Behaviour of Swimming Micro-Organisms*, T. J. Pedley
- 3:45 USNCTAM2010-784: *Swimming in Turbulent Waters: A New Mechanism for Phytoplankton Patchiness in the Ocean*, W. M. Durham, E. Climent, R. Stocker
- 4:10 USNCTAM2010-836: *Swimming at Low Reynolds Number in a Stratified Fluid*, A. Ardekani, R. Stocker

Biomechanics

3-6 Molecular and Cellular Biomechanics: Adhesion, Cell-ECM Interaction, and Mechanotransduction

TC208 3-6-5 Cell Adhesion

2:55 p.m. – 5:00 p.m., Room 208

Organizer: S. Zhang, G. Bao, H. Gao, K. J. Hsia, J. Li, K. Grosh

Session Chair: S. Sun

- 2:55 USNCTAM2010-327: *Lifetime and Strength of Periodic Bond Clusters between Elastic Media under Inclined Loading*, J. Qian, H. Gao
- 3:20 USNCTAM2010-571: *Modeling and Simulation of Cell Spreading Based on a Coarse-Grained Contact/Adhesion Model*, X. Zeng, S. Li
- 3:45 USNCTAM2010-1180: *Learning from the Bad: Virus-Inspired Design of Nanoparticles for Cell-Type Specific Drug Delivery*, S. Zhang, H. Yuan, J. Li, G. Bao

Concurrent Sessions—*Tuesday continued*

- 4:10 USNCTAM2010-1300: *Mechanical and Chemical Effects in the Adhesion of Shells*, J. L. Bassani, R. M. Springman

3-9 Biological Materials and Constituents from Nano to Macro

TC206 3-9-1 Nano to Macro—I

2:55 p.m. – 5:00 p.m., Room 206

Organizers: M. J. Buehler, L. Dorfmann

Session Chair: G. deBotton

- 2:55 **Keynote Presentation:** USNCTAM2010-1408: *Novel Synthetic Material Mimicking Mechanisms from Natural Nacre*, H. D. Espinosa, A. L. Juster, F. Latourte, O. Y. Loh
- 3:45 USNCTAM2010-804: *The Mechanics of Spontaneous Rotational Reversal in Phycomyces*, M. Tabor, A. Goriely
- 4:10 USNCTAM2010-1433: *Possible Consequences of Elastin Loss and Vasoactive Dysfunction in Aortic Aging, Hypertension, and Marfan's Syndrome: A Thick-Walled Constrained Mixture Model*, A. Valentin III, J. D. Humphrey, G. A. Holzapfel
- 4:35 USNCTAM2010-732: *The Non-Equilibrium Thermodynamics and Kinetics of Focal Adhesion Dynamics*, J. E. Olberding, M. D. Thouless, E. Arruda, K. Garikipati

Mechanics of Materials and Structures

4-4 Mechanics of Crystalline Nanostructures

TC207 4-4-4 Plasticity and Failure of Nanocrystalline Materials—I

2:55 p.m. – 5:00 p.m., Room 207

Organizers: H. Park, H. D. Espinosa

Session Chair: H. Park

- 2:55 **Keynote Presentation:** USNCTAM2010-326: *Competing Grain-Boundary- and Dislocation-Mediated Mechanisms in Plastic Strain Recovery in Nanocrystalline Aluminum*, X. Li, Y. Wei, H. Gao
- 3:45 USNCTAM2010-1391: *Grain Boundary Mediated Deformation in Ultrafine Grained Crystals*, D.-W. Lee, M. Koslowski
- 4:10 USNCTAM2010-303: *In Situ Tensile Testing of Quasi 1D Nanostructures in Electron Microscopes*, D. Gianola
- 4:35 USNCTAM2010-1135: *Strain Hardening in Cu Micropillars: Experiments and Modeling*, G. Padubidri, S. Keralavarma, D. Kiener, G. Dehm, A. A. Benzerga

4-5 Mechanics of Materials and Structures for Extreme Environments

TC1 4-5-1 Mechanics of Materials for Extreme Environments

2:55 p.m. – 5:00 p.m., Deans Hall 1

Organizer: V. Prakash

Session Chair: X. Yu

- 2:55 USNCTAM2010-544: *Freezing Effects on the Soil-Structural Interactions*, Z. Liu, X. Yu
- 3:20 USNCTAM2010-739: *Modeling the Inter Friction Mechanism between Parallel Wires of Suspension Bridge Cables*, A. Montoya, H. Waisman, R. Betti, I. C. Noyan
- 3:45 USNCTAM2010-1338: *Microstructural Modeling of Crystalline Material Failure*, M. Ek-khodary, W. M. Lee, M. A. Zikry
- 4:10 USNCTAM2010-1414: *The Onset of Spallation in Nanocrystalline Metals at the Atomic Scale*, A. M. Dongare, B. LaMattina, A. M. Rajendran, D. W. Brenner, M. M. Zikry
- 4:35 USNCTAM2010-549: *A Thermo-Chemo-Mechanically Coupled Theory Accounting for Elastic-Viscoplastic Deformations and Expansion Due to a Chemical Reaction*, K. Loeffel, L. Anand

4-7 Structural Health Monitoring

TC108 4-7-2 Structural Health Monitoring—II

2:55 p.m. – 5:00 p.m., Room 108

Organizers: C. Lissenden, D. E. Adams

Session Chair: H. Gao

- 2:55 USNCTAM2010-421: *Mode II Delamination Detection in Composite Materials Using Carbon Nanotube Sensor Thread*, J. L. Abot, M. J. Schulz, V. N. Shanov, Y. Song, M. Srivatsavaya
- 3:20 USNCTAM2010-1060: *Flexural Damage Evaluation of Reinforced Concrete Beams Strengthened with CFRP*, W. Choi, H.-D. Yun
- 3:45 USNCTAM2010-1348: *Enhanced Output Voltage and Power from Aluminum-PZT-Portland Cement Composites*, K. Cook-Chennault, D. Cosaboon, M. Whitzer, D. Castley
- 4:10 USNCTAM2010-322: *Development of Activated Charcoal-PMMA Composites with Superior Electrical Conductivity and Surface Hardness Properties*, M. R. Mada, S. Bandyopadhyay
- 4:35 USNCTAM2010-1438: *Defects Characterization for Structural Health Monitoring Using Classical and Nonclassical Nonlinear Acoustics*, I. Park, K. Y. Jhang, T. H. Lee, C. S. Kim

Concurrent Sessions—Tuesday continued

4-11 Damage and Failure of Composite Materials

TC104 4-11-2 Damage and Failure of Composite Materials—II

2:55 p.m. – 5:00 p.m., Room 104

Organizer: R. Talreja

Session Chair: R. Talreja

- 2:55 USNCTAM2010-927: *Mesoscale Modeling of Size Dependent Strengthening of Particle Reinforced Metal Matrix Composites*, B. McWilliams, K. T. Ramesh, C. Yen
- 3:20 USNCTAM2010-989: *Fracture Behavior of a Self-Healing Toughened Epoxy Adhesive*, H. Jin, G. Miller, D. S. Stradley, N. R. Sottos, S. R. White
- 3:45 USNCTAM2010-990: *Inherent Defect Size: Calculation and Use for Composite Materials*, J. Considine, D. W. Vahey, R. E. Rowlands, K. T. Turner
- 4:10 USNCTAM2010-1036: *Blistering and Delamination in High Temperature Polymer Matrix Composites*, M. Czabaj, A. Zehnder

4-18 Mechanics of Random and Fractal Materials

TC106 4-18-2 Mechanics of Random Materials—II

2:55 p.m. – 5:00 p.m., Room 106

Organizer: M. Ostoja-Starzewski

Session Chair: C. Picu

- 2:55 USNCTAM2010-387: *Macroscopic Strength Domains for Statistically Defined Heterogeneous Media*, R. Lipton, B. Alali
- 3:20 USNCTAM2010-450: *Computing Mechanical Properties from Microtomographic Data by Extended Hashin-Shtrikman-Willis Variational Principle*, K. Matous, H. Lee
- 3:45 USNCTAM2010-556: *Stress Fields Generated by Surface Triple-Grain Junctions*, E. D. Reedy
- 4:10 USNCTAM2010-379: *A Continuum Model for Steady Granular Flow*, K. Kamrin
- 4:35 USNCTAM2010-872: *Experimental and Computational Multiscale Modeling of Heterogeneous Nanocomposite Adhesives*, K. Schreuder, K. Matous, I. Jasiuk

4-25 Symposium Honoring Professor Robert M. McMeeking on the Occasion of His 60th Birthday

TC2 4-25-2 McMeeking—II

2:55 p.m. – 5:00 p.m., Deans Hall 2

Organizers: C. M. Landis, M. R. Begley

Session Chairs: C. M. Landis, M. R. Begley

- 2:55 USNCTAM2010-412: *Modeling Arbitrary Multiple Cracks in 3D Textile Composites Using Hybrid BM and A-FEM Formulation*, C. Roux, Q. Yang, B. Cox
- 3:20 USNCTAM2010-547: *Steady-State Mode III Delamination Crack in a Periodically Layered Composite*, M. Ryvkin
- 3:45 USNCTAM2010-894: *Modeling the Mechanical Response of Fibrous Monolith Composites*, P. Charalambides, L. Lu
- 4:10 USNCTAM2010-1016: *Local Phase-Separation Dynamics Coupled with Global Membrane Morphogenesis*, C. Huang, H. Yuan, S. Zhang
- 4:35 USNCTAM2010-1109: *Failure Mechanics of Organic/Inorganic Multilayer Permeation Barriers in Flexible Electronics*, T. Li, Z. Jia, M. B. Tucker

4-30 Multiscale Mechanical Characterization and Modeling of Porous Materials

TC218 4-30-2 Multiscale Mechanical Characterization and Modeling of Porous Media—II

2:55 p.m. – 5:00 p.m., Room 218

Organizers: J. Andrade, H. M. Jennings

Session Chair: J. Andrade

- 2:55 USNCTAM2010-619: *Surface Slumping of Submarine Slope and Its Relation to Material Instability*, W. Sun, J. Andrade
- 3:20 USNCTAM2010-1091: *Natural Fiber Reinforced Concrete: Microstructure, Internal Curing, and Mechanical Properties from Nanoindentation and Macroscopic Testing*, C. Bobko, A. Elsaid, M. D'Antonio, R. Seracino
- 3:45 USNCTAM2010-1163: *Implicit Three-Dimensional Finite Strain Biphasic Mixture Dynamic Finite Element Analysis of an Elasto-Plastic Geomaterial*, R. Regueiro, D. Ebrahimi
- 4:10 USNCTAM2010-1230: *A Nanoscale Numerical Model to Predict Macroscale Properties of Cement Paste*, P. C. Fonseca, H. M. Jennings, J. Andrade
- 4:35 USNCTAM2010-767: *Using Indentation to Characterize the Poroelasticity of Gels*, Y. Hu, X. Zhao, J. Vlassak, Z. Suo

Concurrent Sessions—*Tuesday continued*

Dynamics

5-1 General

TC3 5-1-1 Dynamics of Machines and Mechanisms

2:55 p.m. – 5:00 p.m., Senate 3

Organizer: J. Cusumano

Session Chairs: R. Leishear, L. Passmore

- 2:55 USNCTAM2010-311: *The Dynamic Analysis of the Hydraulic Motor with Swinging Bevel Gears*, L. Huran
- 3:20 USNCTAM2010-596: *Higher Mode Frequency Effects on Machinery Resonance and Drilling*, R. Leishear
- 3:45 USNCTAM2010-884: *Determination of Cutting Force Coefficients for Dynamic Stability of Milling Process*, P. A. Pop
- 4:10 USNCTAM2010-944: *Development of Machining Support System Based on Machining Model via Bilateral Control*, T. Osada

5-10 Dynamics and Stability of Human Movement Systems

TC4 5-10-6 Quantifying the Dynamics of Human Movement

2:55 p.m. – 5:00 p.m., Senate 2

Organizers: M. Tanaka, J. Dingwell

Session Chairs: E. T. Hsiao-Wecksler, B. Feeny

- 2:55 USNCTAM2010-1134: *Inter-Trial Dynamics in a Virtual Shuffleboard Experiment*, J. John, J. Cusumano
- 3:20 USNCTAM2010-900: *Classifying the Effects of Mild Traumatic Brain Injury on Postural Sway by Scale-Dependent Lyapunov Exponent*, J. Gao, J. Hu, T. Buckley, K. White, C. Hass
- 3:45 USNCTAM2010-1221: *Nonlinear Dynamics of Human Postural Control: Classification and Characterization*, C. Willey, A. Shukla
- 4:10 USNCTAM2010-775: *Complexity and Variability in Manual Wheelchair Propulsion*, J. J. Sosnoff, Z. Rampurawala, S. Daigle, L. DiBerardino, K. Park, E. T. Hsiao-Wecksler
- 4:35 USNCTAM2010-687: *Biomechanics of Step Synchronization During Side by Side Walking: Two Preliminary Investigations*, J. Nessler, J. Cowell, T. Gonzales, G. Kephart, M. Steinbrick, C. DeLeone

CONCURRENT SESSIONS

Wednesday, June 30

Concurrent Sessions

Wednesday A, 9:15 – 11:20 a.m.

Computational Methods

1-3 Numerical and Analytical Methods in Mechanics of Solids

WA203 1-3-3 Numerical and Analytical Methods in Mechanics of Solids—II

9:15 a.m. – 11:20 a.m., Room 203

Organizer: E. S. Ventsel

Session Chair: E. S. Ventsel

9:15 USNCTAM2010-494: *Three-Dimensional Elastic and Electric Fields in Nitride-Based Semiconductor Quantum Dots*, E. Pan, Y. Zhang, M. Denda

9:40 USNCTAM2010-503: *Numerical Implementation of a Two-Scale Constitutive Model for Granular Soils*, M. Manzari, K. Yonten

10:05 USNCTAM2010-598: *An Analysis of Nanoindentation in Elastoplastic Materials*, S. Moore, M. Manzari, Y.-L. Shen

10:30 USNCTAM2010-662: *A Boundary Integral Formulation for the Numerical Solution of Sandwich Plates of Arbitrary Plan Form*, E. S. Ventsel, I. Boykov, S. Alatkin

10:55 USNCTAM2010-919: *Finite Element Analysis of Two-Dimensional Strain Consolidation under Foundation Loads*, G. Urgessa

1-5 Theoretical and Computational Methods for Critical Material Behavior: Fracture, Dislocation, and Phase Transformation

WA112 1-5-1 Theoretical and Computational Methods for Critical Material Behavior—I

9:15 a.m. – 11:20 a.m., Room 112

Organizers: M. Parks, Y. Chen, X. Li, S. A. Silling

Session Chair: X. Li

9:15 USNCTAM2010-747: *A Unified Interpretation of Stress in Molecular Systems*, N. C. Admal, E. B. Tadmor

9:40 USNCTAM2010-353: *Material Frame Continuum Analysis of Atomistic Simulation*, R. E. Jones, J. Zimmerman

10:05 USNCTAM2010-451: *Nonequilibrium Molecular Dynamics of Complex Structures Using Objective Structures*, K. Dayal, R. D. James, A. Aghaei

10:30 USNCTAM2010-380: *Close to Critical Plastic Flow at Microscale and Effect on the Macroscopic Strain Rate Sensitivity*, C. Picu, R. Li

10:55 USNCTAM2010-593: *The Extended Stiffness Derivative Technique to Extract Strain Energy Release Rates*, H. Waisman

Fluid Mechanics

2-9 Mechanics of Locomotion in Fluids

WA219 2-9-2 Microorganisms—II

9:15 a.m. – 11:20 a.m., Room 219

Organizer: S. Alben

Session Chair: T. J. Pedley

9:15 **Keynote Presentation:** USNCTAM2010-1033: *Aquatic Propulsion in an Intermediate Reynolds Number Regime: Comparative Analysis of 3 Propulsive Mechanisms*, J. Yen

10:05 USNCTAM2010-330: *Mechanics of Microswimmers*, T. Powers

10:30 USNCTAM2010-1049: *Locomotion of Paramecia in Confined Geometries*, S. Jana, S. Jung

2-13 Respiratory Fluid Mechanics

WA205 2-13-3 Airway Closure and Reopening—I

9:15 a.m. – 11:20 a.m., Room 205

Organizer: J. B. Grotberg

Session Chair: J. B. Grotberg

9:15 **Keynote Presentation:** USNCTAM2010-540: *Pulsatile Flow for the Prevention of Atelectrauma-Based Ventilator-Induced Lung Injury*, B. J. Smith, E. Yamaguchi, D. P. Gaver III

10:05 USNCTAM2010-402: *Effects of Gravity in a Model of Airway Reopening*, A. Hazel, M. Heil

10:30 USNCTAM2010-885: *The Impact of Fluid Mechanical Stresses in the Development of Ventilator-Induced Lung Injury*, N. J. Douville, P. Zamankhan, Y.-C. Tung, J. B. Grotberg, S. Takayama

10:55 USNCTAM2010-981: *Influence of Wall Compliance on Epithelial Cell Injury During the Reopening of Pulmonary Airways*, N. Higueta-Castro, X. Chen, C. Mihai, S. Ghadiali

Concurrent Sessions—*Wednesday continued*

Biomechanics

3-3 Nonlinear Modeling of Muscle and Soft Tissue

WA211 3-3-1 Nonlinear Modeling of Muscle and Soft Tissue—I

9:15 a.m. – 11:20 a.m., Room 211

Organizers: J. Brasseur, F. Costanzo

Session Chair: J. Brasseur

- 9:15 **Keynote Presentation:** USNCTAM2010-682: *Arterial Wall Mechanics: Modeling, Analysis and Ultra-Sound Interrogation*, J. Walton
- 10:05 USNCTAM2010-315: *The Inapplicability of the Laplace Law for the Measurement of Wall Stiffness of Biological Tissue, and a Replacement*, J. Brasseur, F. Costanzo
- 10:30 USNCTAM2010-1090: *A New Variational Procedure for Estimating the Macroscopic Behavior of Soft Collagenous Tissues*, G. deBotton, G. Shmuel
- 10:55 USNCTAM2010-543: *Effects of Orthotropic Orientation on the Mechanical Response of Double-Twisted Cylinder Structure*, B. Zhang, X. Yu

3-6 Molecular and Cellular Biomechanics: Adhesion, Cell-ECM Interaction, and Mechanotransduction

WA208 3-6-6 Metastasis

9:15 a.m. – 11:20 a.m., Room 208

Organizers: S. Zhang, G. Bao, H. Gao, K. J. Hsia, J. Li, K. Grosh

Session Chair: T. Zhu

- 9:15 **Keynote Presentation:** USNCTAM2010-1062: *Elasticity of Microenvironment and Cancer Metastasis*, X. Tang, T. Kuhlenschmidt, M. Kuhlenschmidt, T. Saif
- 10:05 USNCTAM2010-1086: *Cell Contractile Force Evolution Mapping via Carrier Moire Fringe Patterns*, X. Zheng, X. Zhang
- 10:30 USNCTAM2010-1346: *Computational Study of Cell Crawling*, S. Roy, J. Qi

3-9 Biological Materials and Constituents from Nano to Macro

WA206 3-9-2 Nano to Macro—II

9:15 a.m. – 11:20 a.m., Room 206

Organizers: M. J. Buehler, L. Dorfmann

Session Chair: M. Tabor

- 9:15 USNCTAM2010-557: *The Geometry and Mechanics of Helical Structures*, A. Goriely, A. Hausrath
- 9:40 USNCTAM2010-1072: *A Micromechanics Approach to Remodeling of Soft Tissues with One Family of Fibers*, G. deBotton, Y. Goldenberg
- 10:05 USNCTAM2010-1137: *Micromechanical Modeling of Microtubules*, M. Arslan, M. C. Boyce
- 10:30 USNCTAM2010-1113: *Aspects of Modeling Muscle Properties in a Soft-Bodied Arthropod*, C. Paetsch, H.-T. Lin, W. Woods, B. Trimmer, L. Dorfmann
- 10:55 USNCTAM2010-751: *Micromechanical Modeling of the Epimysium of Skeletal Muscle*, Y. Gao, A. Waas, A. Wineman

Mechanics of Materials and Structures

4-1 General

WA109 4-1-1 Mechanics of Materials & Structures—I

9:15 a.m. – 11:20 a.m., Room 109

Organizer: C. Bakis

Session Chair: P. Mott, L. Berhan

- 9:15 USNCTAM2010-1254: *Negative Poisson's Ratio Behavior in Fiber-Reinforced Composites*, L. Berhan, S. Jayanty
- 9:40 USNCTAM2010-357: *Limits to Poisson's Ratio*, P. Mott, J. R. Dorgan, C. M. Roland
- 10:05 USNCTAM2010-925: *Effective Material Properties of a Macroscopically Anisotropic Polycrystal Made of Cubic Single Crystals*, Y. Mikata
- 10:30 USNCTAM2010-1075: *Analysis of a PDE Model of Dislocation Mechanics*, A. Das, A. Acharya, J. Zimmer
- 10:55 USNCTAM2010-1223: *On Rounding Corners to Remove Stress Singularities*, G. Sinclair, G. Meda, B. S. Smallwood

4-4 Mechanics of Crystalline Nanostructures

WA207 4-4-5 Plasticity and Failure of Composites, Biomaterials, Alloys—I

9:15 a.m. – 11:20 a.m., Room 207

Organizers: H. Park, H. D. Espinosa

Session Chair: J. Crone

- 9:15 USNCTAM2010-401: *Weak Interface Strengthening Mechanisms in Dissimilar Crystalline Composites*, J. Wang, A. Misra, R. Hoagland, J. Hirth
- 9:40 USNCTAM2010-576: *Multiscale Modeling of Fracture of Magnesia with Different Interatomic Potentials*, J. Chen, J. Lee

Concurrent Sessions—*Wednesday continued*

- 10:05 USNCTAM2010-736: *The Effects of Misfit Strain on Ignition Temperature in NiAl Reactive Multilayers*, J. Crone, J. Knap, P. W. Chung, B. M. Rice
- 10:30 USNCTAM2010-974: *Molecular Dynamics Study of Dislocation Structure and Properties of RDX Using a Flexible Molecule Potential*, L. B. Munday, S. D. Solares, P. W. Chung, B. M. Rice

4-7 Structural Health Monitoring

WA108 4-7-3 Structural Health Monitoring—III

9:15 a.m. – 11:20 a.m., Room 108

Organizers: C. Lissenden, D. E. Adams

Session Chair: C. Lissenden

- 9:15 USNCTAM2010-1437: *Rotorcraft Structural Health and Usage Monitoring—Navy Perspective*, I. Perez, J. Kinzer, M. Yu, B. Frazier, N. Phan
- 10:05 USNCTAM2010-1214: *Impact Localization, Estimation, and Damage Prediction on a Composite Wing Using Distributed FBG Sensors*, A. Chattopadhyay, C. K. Coelho, A. Moncada, C. Hiche
- 10:30 USNCTAM2010-424: *Evaluating Sensor Performance via ROC Curves as Low Energy Impacts Damage a Composite Wing*, M. Seaver, E. Aktas, S. T. Trickey
- 10:55 USNCTAM2010-839: *Robust Crack Detection in Geometrically Complex Metallic Components Using Vibro-Acoustic Modulation*, N. C. Yoder, D. E. Adams

4-11 Damage and Failure of Composite Materials

WA104 4-11-3 Damage and Failure of Composite Materials—III

9:15 a.m. – 11:20 a.m., Room 104

Organizer: R. Talreja

Session Chair: R. Talreja

- 9:15 USNCTAM2010-1271: *Controlled Crack Arrest in Brittle Thin Films: The Effect of Embedded Voids*, L. Liu, X. Chen, Q. Zhou
- 9:40 USNCTAM2010-1304: *Damage Process of Quasi-Three-Dimensional Composites*, D. Liu, K. Rosario
- 10:05 USNCTAM2010-1319: *Modelling of Kink Band Formation in Composite Materials*, H. M. Jensen
- 10:30 USNCTAM2010-1344: *Effect of Processing Methods on the Mechanical Behavior of Epoxy/Nanoclay Nanocomposites*, M. Hosur, A. Agubra, S. Zainuddin, S. Jeelani

4-13 Structures and Devices with Multifunctional or Smart Materials: Design and Analysis

WA105 4-13-1 Devices and Applications Using Multifunctional or Smart Materials

9:15 a.m. – 11:20 a.m., Room 105

Organizers: A. Srinivasa, S. M. Srinivasan

Session Chair: A. Srinivasa

- 9:15 USNCTAM2010-1212: *Microfluidic Channels Formed by Collapse of Soft Stamp*, B. Xu, X. Chen
- 9:40 USNCTAM2010-976: *Modeling and Parameter Optimization of an Aeroelastic Flutter Energy Harvester*, M. Bryant, E. Garcia
- 10:05 USNCTAM2010-966: *A Multifunctional Acoustic Metamaterial*, K. Mikoshiba, C.T. Sun
- 10:30 USNCTAM2010-1272: *Electrolyte Infiltration and Transport in Nanochannels and the Implications for Energy Conversion*, L. Liu, X. Chen

4-18 Mechanics of Random and Fractal Materials

WA106 4-18-3 Mechanics of Fractal Materials—III

9:15 a.m. – 11:20 a.m., Room 106

Organizer: M. Ostoja-Starzewski

Session Chair: K. Matous

- 9:15 USNCTAM2010-339: *Wave Propagation in Linear Chains with Self-Similar Harmonic Interactions*, T. M. Michelitsch, G. A. Maugin, F. C. G. A. Nicolleau, A. F. Nowakowski, S. Derogar
- 9:40 USNCTAM2010-382: *Formulations for the Mechanics of Materials with Fractal Microstructures*, C. Picu, M. Soare
- 10:05 USNCTAM2010-1233: *Generalized Continuum Mechanics of Fractal Microstructures*, J. Li, M. Ostoja-Starzewski
- 10:30 USNCTAM2010-1187: *On the Wave Motion in Elastic Fractal Anisotropic Solids*, H. Joumaa, M. Ostoja-Starzewski
- 10:55 USNCTAM2010-821: *Fractals in Elastic-Hardening Plastic Materials*, M. Ostoja-Starzewski, J. Li

4-23 Multi-Scale Modeling and Response of Nano-Structures

WA1 4-23-1 Multi-Scale Modeling and Response of Nano-Structures

9:15 a.m. – 11:20 a.m., Deans Hall 1

Organizer: E. Mockensturm

Session Chair: E. Mockensturm

Concurrent Sessions—*Wednesday continued*

- 9:15 USNCTAM2010-405: *Modeling Nano-Scale Indentation of Cement Paste*, C. Jones, Z. Grasley
- 9:40 USNCTAM2010-465: *Constitutive Modeling of Aggregated Structures Using Backbone Chain Theory*, R. Dargaznay, M. Itskov
- 10:05 USNCTAM2010-1038: *Nanoscale Modeling of CO₂-Assisted Bonding Processes in Polymer Thin Films*, C. Alleman, A. Srivastava, S. Ghosh
- 10:30 USNCTAM2010-1266: *Boundary Cauchy-Born Analysis of Surface Stress Effects on Nanowires*, A. Aghaei, M. J. Abdolhosseini Qomi, W. Tayyeb, A. R. Khoei
- 10:55 USNCTAM2010-1301: *Effects of Material Anisotropy on Nanostructures Arising from Diffusional Phase Separation*, Q. Shi, J. L. Bassani

4-25 Symposium Honoring Professor Robert M. McMeeking on the Occasion of His 60th Birthday

WA2 4-25-3 McMeeking—III

9:15 a.m. – 11:20 a.m., Deans Hall 2

Organizers: C. M. Landis, M. R. Begley

Session Chairs: C. M. Landis, M. R. Begley

- 9:15 USNCTAM2010-378: *Programmable Deformation with Soft Active Materials*, X. Zhao, Z. Suo
- 9:40 USNCTAM2010-440: *Parameter Identification for Phase Field Models of Ferroelectric Materials*, B. Voelker, M. Kamlah
- 10:05 USNCTAM2010-581: *R-Curve Behavior of Lanthanum Doped Bismuth Ferrite—Lead Titanate as a Function of Lattice Distortion*, K. Webber, S. Cheng, T. Leist, W. Jo, J. Rödel
- 10:30 USNCTAM2010-590: *Homogenization-Based Constitutive Models for Magneto-Rheological Elastomers*, P. Ponte Castaneda, E. Galipeau
- 10:55 USNCTAM2010-668: *Multiscale Finite Element Analysis of Ferroelectric Single Crystals*, C. Lynch

4-28 Measurement and Modeling of High-Strain-Rate Deformation

WA107 4-28-1 Measurement and Modeling of High-Strain-Rate Deformation—I

9:15 a.m. – 11:20 a.m., Room 107

Organizer: I. Smid, J. Gabryš

Session Chair: T. J. Eden

- 9:15 USNCTAM2010-1368: *High-Impact Modeling of Composite Particles in Cold Spray Coating*, G. Aggarwal, I. Smid, A. E. Segall, T. J. Eden

- 10:05 USNCTAM2010-1047: *Observations on the Numerical Modeling of High Velocity Impact of Micron Scale Particles*, B. Yildirim, S. Muftu, A. Gouldstone
- 10:30 USNCTAM2010-526: *An Overview of Dynamic Compaction in Powder Metallurgy*, G. Sethi, N. S. Myers, R. M. German
- 10:55 USNCTAM2010-360: *Comparison of Transient Stress-Strain Response to Linear Dynamic Behavior of Rubber*, P. Mott, J. N. Twigg, C. M. Roland, K. E. Nugent, T. E. Hogan, C. G. Robertson

4-30 Multiscale Mechanical Characterization and Modeling of Porous Materials

WA218 4-30-3 Multiscale Mechanical Characterization and Modeling of Porous Media—III

9:15 a.m. – 11:20 a.m., Room 218

Organizers: J. Andrade, H. M. Jennings

Session Chair: J. Andrade

- 9:15 USNCTAM2010-1174: *Studying the Mechanical Properties and Material Strength of Layered Geomaterials Using Discrete Element Methods*, S. Buechler, J. Berger, G. Mustoe
- 9:40 USNCTAM2010-1269: *Micromechanical Modeling of Porous Electrospun Nanofiber Mats*, M. N. Silberstein, C.-L. Pai, G. C. Rutledge, M. C. Boyce
- 10:05 USNCTAM2010-1293: *Mechanical Behavior of Co-Continuous Polymer Composites*, L. Wang, M. C. Boyce
- 10:30 USNCTAM2010-874: *Microstructure-Property Relations for Balsa Wood*, O. Shishkina, L. Gorbatikh, M. Moesen, S. V. Lomov, I. Verpoest
- 10:55 USNCTAM2010-1436: *Time Effects in Granular Materials: Consistent Macro Behavior versus Scattered Micro Behavior*, P. V. Lade, H. Karimpour

Dynamics

5-7 Nonlinear Dynamics in Physiology and Medicine

WA3 5-7-1 Nonlinear Dynamics in Physiology and Medicine

9:15 a.m. – 11:20 a.m., Senate 3

Organizers: X. Zhao, W. Ying, Q. Lu

Session Chairs: N. F. Otani, X. Zhao

- 9:15 USNCTAM2010-1238: *Predicted Response of the Peroxidase-Oxidase Reaction to Continuing ROS Input*, W. Schaffer, T. Bronnikova

Concurrent Sessions—Wednesday continued

- 9:40 USNCTAM2010-727: *Numerical Investigation on the Interaction between Mechanical Contraction and Electrical Propagation in Cardiac Dynamics*, H. Xia, K. L. Wong, X. Zhao
- 10:05 USNCTAM2010-848: *Termination of Reentrant Cardiac Action Potential Propagation Using Far-Field Electrical Pacing*, N. F. Otani
- 10:30 USNCTAM2010-1365: *Mechanism of Synchronization Types of Coupled Smooth Chaotic Dynamical Systems*, L. Pei, Y. Gao
- 10:55 USNCTAM2010-786: *A Mathematical Model for Describing Stage Conversion of Toxoplasma Gondii*, W. Jiang, A. Sullivan, C. Su, X. Zhao

5-9 Computational Methods for Dynamical Systems Analysis

WA4 5-9-1 Continuation Methods

9:15 a.m. – 11:20 a.m., Senate 2

Organizers: H. Dankowicz, M. West

Session Chairs: H. Dankowicz, E. Coetzee

- 9:15 USNCTAM2010-420: *Starting Homoclinic Tangencies Near 1:1 Resonances*, J. Paez Chavez
- 9:40 USNCTAM2010-455: *Numerical Implementation of a Homotopy Method for Computing Homoclinic and Heteroclinic Orbits*, V. De Witte, W. Govaerts, Y. A. Kuznetsov
- 10:05 USNCTAM2010-500: *A Multi-Point, Boundary-Value-Problem, Collocation Toolbox for the Continuation of Sets of Constrained Orbit Segments*, H. Dankowicz, F. Schilder
- 10:30 USNCTAM2010-539: *Flowbox Tilings for Computing Closed Invariant Manifolds*, M. E. Henderson
- 10:55 USNCTAM2010-827: *The Dynamical Systems Toolbox: Integrating AUTO into Matlab*, E. Coetzee, B. Krauskopf, M. Lowenberg

CONCURRENT SESSIONS

Thursday, July 1

Concurrent Sessions

Thursday A, 9:15-11:20 a.m.

Computational Methods

1-3 Numerical and Analytical Methods in Mechanics of Solids

RA203 1-3-4 Numerical and Analytical Methods in Mechanics of Solids—III

9:15 a.m. – 11:20 a.m., Room 203

Organizer: E. S. Ventsel

Session Chair: A. Idesman

- 9:15 USNCTAM2010-702: *Computationally Efficient Micro Crack Modeling in Statics and Dynamics Based on Simplified Crack Tip Enrichments Within the Extended Finite Element Method*, X. Liu, H. Waisman
- 9:40 USNCTAM2010-846: *Computational Modeling of Collective Behavior of Carbon Nanotubes*, H. Radhakrishnan, S. Mesarovic
- 10:05 USNCTAM2010-805: *Finite Strain Analysis of Almost Incompressible Hyperelastic Solids by Mixed P-Type Method*, M. Tanveer, J. W. Zu
- 10:30 USNCTAM2010-734: *A New Numerical Approach to Accurate Time Integration of Structural Dynamics and Wave Propagation Problems*, A. Idesman, M. Schmidt, J. Foley

1-5 Theoretical and Computational Methods for Critical Material Behavior: Fracture, Dislocation, and Phase Transformation

RA112 1-5-2 Theoretical and Computational Methods for Critical Material Behavior—II

9:15 a.m. – 11:20 a.m., Room 112

Organizers: M. Parks, Y. Chen, X. Li, S. A. Silling

Session Chair: Y. Chen

- 9:15 USNCTAM2010-1007: *Coarse-Graining Lattice Dynamics by Finite Element Method—Theoretical Formulation*, Y. Chen, L. Xiong
- 9:40 USNCTAM2010-749: *Coupled Atomistic and Continuum Computational Method for the Simulation of Crack Propagation*, X. Li

- 10:05 USNCTAM2010-1087: *Adaptive Spacetime Method with Riemann Jump Conditions for Coupled Atomistic/Continuum Dynamics*, S. Miller, B. Kraczek, R. Haber, D. D. Johnson
- 10:30 USNCTAM2010-397: *A Linear Scaling Method for Molecular Mechanics Modeling*, P. Ming, J. Chen
- 10:55 USNCTAM2010-591: *A Multiple-Length/Time-Scale Algorithm for Concurrent Atomistic/Continuum Simulation*, X. Wang, J. Lee

Fluid Mechanics

2-9 Mechanics of Locomotion in Fluids

RA219 2-9-3 Macroorganisms: Flight

9:15 a.m. – 11:20 a.m., Room 219

Organizer: S. Alben

Session Chair: L. Miller

- 9:15 **Keynote Presentation:** USNCTAM2010-1315: *Span Efficiencies of Wings at Low Reynolds Number*, G. Spedding, J. McArthur
- 10:05 USNCTAM2010-1224: *How Insects Fly and Turn*, Z. J. Wang
- 10:30 USNCTAM2010-1064: *Dynamics of Continuous Free-Flight Yaw Turns in the Hawkmoth Manduca Sexta*, T. Hedrick
- 10:55 USNCTAM2010-337: *High-Fidelity Computational Fluid Models of Insects in Flight: Wing Deformation and Flight Maneuvers*, R. Mittal, L. Zheng, T. Hedrick

2-13 Respiratory Fluid Mechanics

RA205 2-13-2 Respiratory Particle Dynamics and Deposition

9:15 a.m. – 11:20 a.m., Room 205

Organizer: J. B. Grotberg

Session Chair: M. Filoche

- 9:15 USNCTAM2010-738: *Flow Patterns and Particle Transport in an Expanding/Contracting Model of a Human Alveolus*, S. Chhabra, A. Prasad
- 9:40 USNCTAM2010-801: *Modeling the Complex Coupling of Air Flow and Particle Deposition During Ventilation of the Human Airway Tree*, S. Amin, A. Majumdar, B. Suki
- 10:05 USNCTAM2010-910: *Particle Separation in a Lung-Like Ramified Structure*, J. Andrade, T. Vasconcelos, A. Morais, R. Cisne, E. Parteli

Concurrent Sessions—Thursday continued

- 10:30 USNCTAM2010-1028: *The Multiplicative Map of Particle Deposition into the Tracheobronchial Tree*, M. Filoche, T. Vasconcelos, J. Andrade, B. Sapoval, A. Soualah, J. B. Grotberg, M. Florens
- 10:55 USNCTAM2010-1243: *Simulation of Deposition in the Pulmonary Acinus*, F. Henry, A. Tsuda

Biomechanics

3-3 Nonlinear Modeling of Muscle and Soft Tissue

RA211 3-3-2 Nonlinear Modeling of Muscle and Soft Tissue—II

9:15 a.m. – 11:20 a.m., Room 211

Organizers: J. Brasseur, F. Costanzo

Session Chair: F. Costanzo

- 9:15 USNCTAM2010-1321: *A Natural Modeling Tool for Soft Tissues: The Finite Element Immersed Boundary Method*, L. Heltai
- 9:40 USNCTAM2010-1045: *A Nonlinear Viscoelastic Fractional Derivative Model of Infant Hydrocephalus*, K. P. Wilkie, C. Drapaca, S. Sivaloganathan
- 10:05 USNCTAM2010-530: *Modeling the Brain Neuro-Mechanics*, C. Drapaca

3-5 Mechanics and Biology

RA1 3-5-1 Cell and Protein Mechanics

9:15 a.m. – 11:20 a.m., Deans Hall 1

Organizer: S. Cowin

Session Chair: Y. Lanir

- 9:15 USNCTAM2010-719: *How deeply cells feel*, D. Discher
- 9:40 USNCTAM2010-395: *Constitutive Modeling of Fibroblast-Populated Collagen Gels*, J. Holmes
- 10:05 USNCTAM2010-695: *Mechanical Failure of Protein Materials in Extreme Conditions and Disease*, M. J. Buehler
- 10:30 USNCTAM2010-574: *Comparison of Brownian Dynamics-Based Estimates of Polymer Tension with Direct Force Measurements*, M. Arsenault, P. Purohit, Y. Goldman, H. Shuman, H. Bau
- 10:55 USNCTAM2010-1186: *Indentation of Mechanically Heterogeneous Samples: Developing a Hybrid Computational Model for AFM Data Analysis*, K. D. Costa, E. U. Azeloglu, G. Kaushik

3-6 Molecular and Cellular Biomechanics: Adhesion, Cell-ECM Interaction, and Mechanotransduction

RA208 3-6-7 Molecular Biomechanics

9:15 a.m. – 11:20 a.m., Room 208

Organizers: S. Zhang, G. Bao, H. Gao, K. J. Hsia, J. Li, K. Grosh

Session Chair: J. Qi

- 9:15 USNCTAM2010-1161: *Characterization of Erythrocytes from Healthy Individuals and from Patients with the Sick Cell Trait*, J. L. Maciaszek, G. Lykotrafitis
- 9:40 USNCTAM2010-931: *HuR Is a Mechanosensitive Gene That Mediates Inflammatory Response in HU-VECs*, G. Bao, W. J. Rhee
- 10:05 USNCTAM2010-374: *Twisting DNA and Its Implications on Gene Regulation*, P. Purohit
- 10:30 USNCTAM2010-1287: *Real Time Imaging of Cytoskeletal Responses to Mechanical Stretch in 3D Culture*, S.-L. Lee, A. Nekouzadeh, P. Schaefer, B. Butler, A. Nathan, W. Legant, K. Pryse, E. Elson, G. Genin

3-9 Biological Materials and Constituents from Nano to Macro

RA206 3-9-3 Nano to Macro—III

9:15 a.m. – 11:20 a.m., Room 206

Organizers: M. J. Buehler, L. Dorfmann

Session Chair: L. Dorfmann

- 9:15 USNCTAM2010-373: *Fibrin Networks Sustain Large Extensions Due to Protein Unfolding*, P. Purohit
- 9:40 USNCTAM2010-383: *Multiscale Mechanics of Cross-Linked and Non-Woven Random Fiber Networks*, C. Picu, H. Hatami-Marbini, G. Subramanian
- 10:05 USNCTAM2010-535: *Atomistic and Continuum Modeling of Cellular Uptake of Nanoparticles and Viruses*, X. Shi, X. Yi, H. Gao
- 10:30 USNCTAM2010-555: *Linking Mechanics to Biochemistry in Molecular and Cellular Behavior*, P. R. LeDuc
- 10:55 USNCTAM2010-763: *A Coarse-Grain Molecular Dynamics Model for Sick Cell Hemoglobin Fibers and their Interactions*, H. Li, G. Lykotrafitis

Mechanics of Materials and Structures

4-1 General

RA109 4-1-2 Mechanics of Materials & Structures—II

9:15 a.m. – 11:20 a.m., Room 109

Organizer: C. Bakis

Session Chair: H. A. Rasheed

9:15 USNCTAM2010-1396: *How Biaxial Membrane Loads Influence the Modal Damping of Flexural Structures*, J. L. Kauffman, G. Lesieutre

9:40 USNCTAM2010-1295: *Wave Propagation in Granular Suspensions Within Tubes*, R. Porowski, J. Damazo, J. E. Shepherd

10:05 USNCTAM2010-1073: *Dynamic Modeling of Inhomogeneous Solids Using a Novel Finite Element*, G. Zhu, M. Maleki

10:30 USNCTAM2010-1215: *Homogenization Condition in Dynamics of Random Micropolar Media*, M. Ostoj-Starzewski

10:55 USNCTAM2010-431: *Post Buckling Behavior of Hemispherical Shell Subjected to Concentrated Load*, S. Nayyeri, H. A. Rasheed

4-3 Multi-Physics of Nanoscale Materials and Interfaces

RA106 4-3-1 Multiphysics of Materials & Interfaces—I

9:15 a.m. – 11:20 a.m., Room 106

Organizers: A. Haque, V. Prakash

Session Chairs: H. Park, A. Haque

9:15 USNCTAM2010-1434: *Optimizing Piezoelectric Films for MEMS Applications*, S. Trolrier-McKinstry

9:40 USNCTAM2010-1362: *Thermal Transport in Suspended and Supported Graphene*, L. Shi

10:05 USNCTAM2010-558: *Heat Transfer and Thermal Expansion in Graphene*, C. Dames

10:30 USNCTAM2010-470: *The Influence of Mechanical Strain on the Optical Properties of Metal Nanoparticles*, H. Park, X. Qian

10:55 USNCTAM2010-1099: *A Multi-Physics Quality Map of Nano Transfer Printing*, T. Li, M. B. Tucker

4-4 Mechanics of Crystalline Nanostructures

RA207 4-4-6 Plasticity and Failure of Nanocrystalline Materials—II

9:15 a.m. – 11:20 a.m., Room 207

Organizers: H. Park, H. D. Espinosa

Session Chair: H. D. Espinosa

9:15 **Keynote Presentation:** USNCTAM2010-1061: *Role of Microstructural Heterogeneity in Nano Grained Metals Revealed by Quantitative TEM Study*, J. Rajagopalan, C. Rentenberger, H.-P. Karnthaler, G. Dehm, T. Saif

10:05 USNCTAM2010-1294: *An Atomistic Study of Strength, Stability and Fracture Mechanisms in Nano-Twinned FCC Metals*, Y. Kulkarni

10:30 USNCTAM2010-953: *A Twist of the Eshelby Twist: A 3D Mechanism of Deformation Twinning*, T. Zhu, Y. Zhong

10:55 USNCTAM2010-781: *Stacking Faults and Twinning in Fcc Nanofilms: A Density Functional Theory Study*, A. Datta, Y. Fu, A. To

4-13 Structures and Devices with Multifunctional or Smart Materials: Design and Analysis

RA105 4-13-2 Phase Transforming Solids—Experiments, Modeling and Simulations

9:15 a.m. – 11:20 a.m., Room 105

Organizers: A. Srinivasa, S. M. Srinivasan

Session Chair: S. M. Srinivasan

9:15 USNCTAM2010-588: *Multistability in Anisotropic Textured Shells*, M. R. Golabchi, S. D. Guest

9:40 USNCTAM2010-595: *A Thermodynamically Based Discrete Preisach Model for Simulating the Bending Response of SMA Wires from Uniaxial Data*, S. Doraiswamy, A. Srinivasa

10:05 USNCTAM2010-1390: *Inter-Martensite Strain Evolution in NiMnGa Single Crystals*, R. F. Hamilton, K. Aslantas, H. Sehitoglu, C. Efstathiou, H. J. Maier

10:30 USNCTAM2010-973: *Simulation of Magnetic Shape Memory Alloy Behavior under Complex Load Paths*, A. Waldauer, H. Feigenbaum, C. Ciocanel

10:55 USNCTAM2010-508: *Domain Microstructure at Free Surfaces in Ferroelectrics*, L. Yang, K. Dayal

Concurrent Sessions—*Thursday continued*

4-21 Mechanics of Dissimilar Materials Interfaces

RA218 4-21-1 Mechanics of Dissimilar Materials Interfaces—I

9:15 a.m. – 11:20 a.m., Room 218

Organizers: J. F. Davalos, A. Chen

Session Chairs: J. P. M. Hoefnagels, O. M. Mukdadi

9:15 USNCTAM2010-377: *Surface-Roughness-Induced Hysteresis in Adhesive Elastic Contacts*, H. Kesari, J. C. Doll, W. Cai, B. L. Pruitt, A. J. Lew

9:40 USNCTAM2010-622: *Hysteresis of Loading-Unloading a Rigid Punch onto a Clamped Membrane*, G. Li, K. Wan

10:05 USNCTAM2010-758: *Copper-Rubber Interface Delamination in Stretchable Electronics*, J. P. M. Hoefnagels, J. Neggers, P. H. M. Timmermans, M. G. D. Geers

10:30 USNCTAM2010-1418: *Ultrasonic Evaluation of CFRP-Concrete Interface for Specimens under Temperature and Water-Immersion Aging Effects*, A. M. Mahmoud, H. H. Ammar, O. M. Mukdadi, I. Ray, F. Imani, A. Chen, J. F. Davalos

10:55 USNCTAM2010-1427: *Mode II Fracture Behavior of CFRP-Concrete Interface Subject to Accelerated Aging*, J. F. Davalos, A. Chen, F. Imani, I. Ray

4-25 Symposium Honoring Professor Robert M. McMeeking on the Occasion of His 60th Birthday

RA2 4-25-4 McMeeking—IV

9:15 a.m. – 11:20 a.m., Deans Hall 2

Organizers: C. M. Landis, M. R. Begley

Session Chairs: C. M. Landis, M. R. Begley

9:15 USNCTAM2010-X: *Can Strain Cues Create Spatial Ordering in Large Cell Populations?* B. Cox

9:40 USNCTAM2010-368: *Outburst Flooding under Ice Sheets as Turbulently Driven Hydraulic Fracture*, J. R. Rice, V. C. Tsai

10:05 USNCTAM2010-992: *Hyperelasticity of Diamond Cubic Crystals Based on Density Functional Theory*, D. Parks, M. Salvetti, N. Marzari, S. Duchenne

10:30 USNCTAM2010-1450: *Compressive Graphene Fracture in CNT Sonication*, H. B. Chew, K.-S. Kim

10:55 USNCTAM2010-369: *On the Path-Dependence of the J-integral near Stationary Cracks for J2 Flow Plasticity with Linear Kinematics*, D. Carka, C. M. Landis

4-28 Measurement and Modeling of High-Strain-Rate Deformation

RA107 4-28-2 Measurement and Modeling of High-Strain-Rate Deformation—II

9:15 a.m. – 11:20 a.m., Room 107

Organizers: I. Smid, J. Gabrys

Session Chair: N. McManus

9:15 USNCTAM2010-1262: *Finite Element Modeling of Rotorblade Erosion*, R. Laverty, N. McManus

10:05 USNCTAM2010-1383: *Comparison of Mechanical and Constitutive Response for Five Aluminum Alloys for Armor Applications*, K. A. Dannemann, S. Chocron, C. E. Anderson Jr

10:30 USNCTAM2010-667: *The Hardness of Cold Sprayed Aluminum*, V. Champagne, D. Helfritsch, M. Trexler, B. Gabriel

10:55 USNCTAM2010-1367: *Simulation of High Strain Rate Metal Forming Applications—Wire Drawing*, D. J. Cunningham, I. Smid, J. M. Keane

4-31 Cyclic Plasticity of Materials: Experimentation and Constitutive Modeling at the Micro and Macroscopic Levels

RA108 4-31-1 Cyclic Plasticity—I

9:15 a.m. – 11:20 a.m., Room 108

Organizers: T. Hassan, C. Lissenden

Session Chairs: B. Xu, C. Lissenden

9:15 USNCTAM2010-523: *Ratcheting, Wrinkling and Collapse of Tubes Due to Axial Cycling under Internal Pressure*, R. Jiao, S. Kyriakides

10:05 USNCTAM2010-1102: *Simulation of Ratcheting Responses of Elbow Pipes*, T. Hassan, S. Rahman

10:30 USNCTAM2010-1216: *Indentation Fatigue Mechanics*, B. Xu, X. Chen

Dynamics

5-1 General

RA104 5-1-3 Wave Propagation and Elastodynamics

9:15 a.m. – 11:20 a.m., Room 104

Organizer: J. Cusumano

Session Chairs: V. Vantsevich, T. Sapsis

9:15 USNCTAM2010-652: *Interior Transmission Problem for Piecewise-Homogeneous Solids*, C. Bellis, B. Guzina

Concurrent Sessions—Thursday continued

- 9:40 USNCTAM2010-823: *Wave Propagation Through Interface in Coupled Atomistic/Continuum Simulation*, X. Wang, J. Lee, Q. Deng
- 10:05 USNCTAM2010-1124: *Dual-Plane Automatic Ball Balancing of an Elastically-Mounted Cylindrical Body*, J. Bolton, L. G. Kraige
- 10:30 USNCTAM2010-1256: *Damping Evaluation for Free Vibration of Structures in Elastodynamic-Acoustic Interaction*, H. Joumaa
- 10:55 USNCTAM2010-1165: *Elastic Impact of Flat Plate Supported by a Linear Chain of Spherical Balls*, A. Celik, M. Gharib, Y. Hurmuzlu

5-5 Dynamical Data Analysis of Multiscale Systems

RA3 5-5-1 Emerging Methods

9:15 a.m. – 11:20 a.m., Senate 3

Organizers: D. Chelidze, J. Cusumano

Session Chairs: B. Feeny, I. Georgiou

- 9:15 USNCTAM2010-868: *Nonlinear Adaptive Detrending, Denoising, and Decomposition of Complex Multiscale Signals*, J. Gao, W. Tung, J. Hu
- 9:40 USNCTAM2010-743: *Global Feature Construction from Chaotic Signal Using Image Processing*, M. Liu
- 10:05 USNCTAM2010-849: *Application of the Smooth Decomposition to the Random Fields*, S. Bellizzi, R. Sampaio
- 10:30 USNCTAM2010-742: *A Multi-Parameter Chaotic Sensor Based on Magnetoelastic Resonance*, M. Liu, D. Chelidze

5-9 Computational Methods for Dynamical Systems Analysis

RA4 5-9-2 Integration Methods

9:15 a.m. – 11:20 a.m., Senate 2

Organizers: H. Dankowicz, M. West

Session Chairs: M. E. Henderson, J. Rankin

- 9:15 USNCTAM2010-830: *Discrete Hamiltonian Variational Integrators*, M. Leok, J. Zhang
- 9:40 USNCTAM2010-855: *Use of Post-Processing to Increase the Order of Accuracy of the Trapezoidal Rule at Time Integration of Linear Elastodynamics Problems*, A. Idesman
- 10:05 USNCTAM2010-782: *Bifurcation Analysis of Mechanisms*, J. Knowles, B. Krauskopf, M. Lowenberg, E. Coetzee, S. Sharma

- 10:30 USNCTAM2010-620: *Canard Cycles of an Aircraft Turning on the Ground*, J. Rankin, B. Krauskopf, M. Lowenberg, M. Desroches

Concurrent Sessions

Thursday B, 12:35 p.m. – 2:40 p.m.

Computational Methods

1-3 Numerical and Analytical Methods in Mechanics of Solids

RB203 1-3-5 Numerical and Analytical Methods in Mechanics of Solids—IV

12:35 p.m. – 2:40 p.m., Room 203

Organizer: E. S. Ventsel

Session Chair: M. Manzari

- 12:35 USNCTAM2010-1250: *Numerical Simulation of Braided Composites via Embedded Representative Unit Cell or Microplane Model*, C. G. Hoover, V. Smilauer, F. C. Caner, Z. Bazant
- 1:00 USNCTAM2010-1251: *Shear Lag Effects Analysis Using Modified Variation Method*, Z. Lin, J. Zhao
- 1:25 USNCTAM2010-1289: *Performance of Enhanced Mixed Elements with Continuous Pressure Approximations as Applied to Porous Geologic Materials*, V. Kaliakin, P. Jiang, M. Khabbazian, C. Meehan

1-5 Theoretical and Computational Methods for Critical Material Behavior: Fracture, Dislocation, and Phase Transformation

RB112 1-5-3 Theoretical and Computational Methods for Critical Material Behavior—III

12:35 p.m. – 2:40 p.m., Room 112

Organizers: M. Parks, Y. Chen, X. Li, S. A. Silling

Session Chair: S. A. Silling

- 12:35 USNCTAM2010-806: *Energy Balance for a Moving Defect in a Peridynamic Solid*, S. A. Silling, R. B. Lehoucq
- 1:00 USNCTAM2010-586: *Peridynamics as an Upscaling of Molecular Dynamics*, P. Seleson, M. Parks, M. Gunzburger, R. B. Lehoucq
- 1:25 USNCTAM2010-459: *Mathematical and Numerical Analysis of Linear Peridynamic Models with Nonlocal Boundary Conditions*, Q. Du, K. Zhou
- 1:50 USNCTAM2010-512: *A Domain Decomposition Method for Local/Nonlocal Coupling*, P. Seleson, M. Parks, M. Gunzburger, R. B. Lehoucq

Concurrent Sessions—Thursday continued

- 2:15 USNCTAM2010-1022: *Convergence and Scaling in Peridynamics for Modeling of Fiber-Reinforced Composites*, W. Hu, F. Bobaru, Y. D. Ha

Fluid Mechanics

2-9 Mechanics of Locomotion in Fluids

RB219 2-9-4 Macroorganisms: Swimming

12:35 p.m. – 2:40 p.m., Room 219

Organizer: S. Alben

Session Chair: S. Alben

- 12:35 USNCTAM2010-306: *Swimming and Flapping in Vortex Wakes*, S. Alben
- 1:00 USNCTAM2010-499: *Mechanics of Flapping in Natural Oscillatory Propulsive Systems: Aquatic Locomotion by Manta Rays and Dolphins with Biomimetic Applications*, F. Fish
- 1:25 USNCTAM2010-648: *Passive Locomotion in a Perfect Fluid*, E. Kanso
- 1:50 USNCTAM2010-972: *A Fast-Starting Robotic Fish that Accelerates at 35 m/s²*, Y. Modarres-Sadeghi, M. Watts, J. Conte, F. Hover, M. Triantafyllou
- 2:15 USNCTAM2010-1239: *The Fluid Dynamics of Feeding and Swimming in the Upside Down Jellyfish*, L. Miller, A. Santhanakrishnan, C. Hamlet

2-13 Respiratory Fluid Mechanics

RB205 2-13-1 Upper Airway Flow and Transport

12:35 p.m. – 2:40 p.m., Room 205

Organizer: J. B. Grotberg

Session Chair: D. J. Taylor

- 12:35 USNCTAM2010-1031: *Fluid Mechanics of Nasal Inspiration*, D. J. Taylor, D. J. Doorly, R. C. Schroter
- 1:00 USNCTAM2010-1129: *Fully-Coupled Fluid-Structure Interaction Model of an Upper Respiratory Airway*, F. Sheer, S. Ghadiali
- 1:25 USNCTAM2010-962: *A Computational Study of Canine Nasal Airflow: Implications Regarding Respiration and Olfaction*, B. Craven, M. Lawson, E. Paterson, G. Settles
- 1:50 USNCTAM2010-1181: *A Computational Study of Odorant Deposition in the Canine Nasal Cavity*, M. Lawson, B. Craven, E. Paterson, G. Settles
- 2:15 USNCTAM2010-809: *Mucin Secretion in Cultured Nasal Epithelial Cells in Response to Airflow Induced Stresses*, N. E.-T. Davidovich, U. Zaretsky, M. Wolf, Y. Kloog, D. Elad

Biomechanics

3-5 Mechanics and Biology

RB1 3-5-2 Constitutive Models of Tissues

12:35 p.m. – 2:40 p.m., Deans Hall 1

Organizer: S. Cowin

Session Chair: M. Sacks

- 12:35 USNCTAM2010-375: *On the Nonlinear Response and Buckling of Growing Arteries*, A. Goriely, R. Vanderschueren
- 1:00 USNCTAM2010-847: *Non-Linear, Inhomogeneous Viscoelasticity of Knee Ligaments and Tissue Engineered Ligaments*, E. Arruda, J. Ma
- 1:25 USNCTAM2010-733: *In Silico Estimates of the Free Energy Changes in Growing Tumor Spheroids*, H. Narayanan, S. N. Verner, K. L. Mills, R. Kemkemer, K. Garikipati
- 1:50 USNCTAM2010-418: *Computational Modeling of Electroactive Cardiac Tissue*, S. Goktepe, E. Kuhl
- 2:15 USNCTAM2010-417: *Recent Progress in a Hypoelastic Theory for Soft Tissue*, A. Freed, D. R. Einstein, M. Sacks

3-6 Molecular and Cellular Biomechanics: Adhesion, Cell-ECM Interaction, and Mechanotransduction

RB208 3-6-8 Membrane Mechanics

12:35 p.m. – 2:40 p.m., Room 208

Organizers: S. Zhang, G. Bao, H. Gao, K. J. Hsia, J. Li, K. Grosh

Session Chair: G. Lykotrafitis

- 12:35 USNCTAM2010-1034: *Equilibrium and Nonequilibrium Mechanics of Semiflexible Cytoskeletal Networks*, W. Klug, A. Missel, M. Bai, A. Levine
- 1:00 USNCTAM2010-1035: *Toward the Highest Level of Coarse-Graining of Biological Membranes: A Simple Anisotropic Pair Potential for Self-Assembled Fluid Membranes*, H. Yuan, C. Huang, J. Li, S. Zhang
- 1:25 USNCTAM2010-1142: *Mechanics of Fusion of a Vesicle to a Plasma Membrane*, R. Long, S. Manohar, A. Jagota, C. Y. Hui, M. Bykhovskaia
- 1:50 USNCTAM2010-1228: *Driving Forces for Shape Evolution of Cell Clusters and Cluster Shape Stability*, A. Nurse
- 2:15 USNCTAM2010-1296: *Interaction of Cellular Membranes with Substrates and Nanoparticles*, A. Agrawal

Concurrent Sessions—Thursday continued

3-9 Biological Materials and Constituents from Nano to Macro

RB206 3-9-4 Nano to Macro—IV

12:35 p.m. – 2:40 p.m., Room 206

Organizers: M. J. Buehler, L. Dorfmann

Session Chair: M. J. Buehler

- 12:35 USNCTAM2010-897: *The Mathematics and Mechanics of Spider Silk*, G. Saccomandi, G. Puglisi
- 1:00 USNCTAM2010-982: *Mechanically-Induced Remodeling of Degradable Biomaterials*, J. A. Kluge, A. Thurber, G. G. Leisk, D. L. Kaplan, L. Dorfmann
- 1:25 USNCTAM2010-1326: *The Corneal Stroma Elasticity: The Electrostatic Contribution of Proteoglycans*, H. Hatami-Marbini, P. Pinsky
- 1:50 USNCTAM2010-1120: *Protection Mechanisms Informed by the Iron-Plated Armor of a Deep-Sea Hydrothermal Vent Gastropod*, H. Yao, M. Dao, S. Suresh, C. Ortiz
- 2:15 USNCTAM2010-999: *Effect of Protein on Nanocrystalline Aragonite*, N. Zhang, Y. Chen

3-11 Mechanics of Traumatic Brain Injury

RB4 3-11-1 Traumatic Brain Injury—I

12:35 p.m. – 2:40 p.m., Senate 2

Organizers: L. Gu, N. Chandra

Session Chairs: L. Gu, A. Sadegh

- 12:35 USNCTAM2010-473: *Mechanics of Traumatic Brain Injury at Multiple Length Scales*, J. van Dommelen, R. J. H. Cloots, M. Hrapko, G. W. M. Peters, M. G. D. Geers
- 1:00 USNCTAM2010-623: *Effect of Anisotropy in a Model of Traumatic Brain Injury*, R. Wright, K.T. Ramesh
- 1:25 USNCTAM2010-887: *Modeling of Subarachnoid Space and Trabeculae Architecture as It Relates to TBI*, P. Saboori, A. Sadegh
- 1:50 USNCTAM2010-748: *Age- and Region-Dependent Mechanical Properties of the Rat Brain for Use in Computational Modeling of TBI*, B. S. Elkin, A. Ilankovan, B. Morrison
- 2:15 USNCTAM2010-1026: *Modeling Shock Response of Helmeted Head Using Fluid Structure Interaction (FSI)*, S. Ganpule, L. Gu, N. Chandra

Mechanics of Materials and Structures

4-1 General

RB109 4-1-3 Mechanics of Materials & Structures—III

12:35 p.m. – 2:40 p.m., Room 109

Organizer: C. Bakis

Session Chair: H.-Y. Kuo

- 12:35 USNCTAM2010-1349: *Effective Dielectric Constant of a 0-3-0 Composite and the Effect of Conductive Inclusion Shape*, S. Banerjee, K. Cook-Chennault
- 1:00 USNCTAM2010-875: *Potential Fields of Fibrous Composites with Piezoelectric and Piezomagnetic Phases*, H.-Y. Kuo
- 1:25 USNCTAM2010-651: *Reconstruction of Heterogeneous Material Properties from Full-Field Measurements: An Extended Equilibrium Gap Method*, G. Lubineau
- 1:50 USNCTAM2010-1182: *From Micro to Nano Scale Molding of Metals: Size Effect in Al Molding*, K. Chen, F. Mei, W. Meng
- 2:15 USNCTAM2010-1110: *Buckling-Induced Strain Deconcentration in Thin Films Patterned with Circular Holes*, T. Li, M. B. Tucker

4-3 Multi-Physics of Nanoscale Materials and Interfaces

RB106 4-3-2 Multiphysics of Materials & Interfaces—II

12:35 p.m. – 2:40 p.m., Room 106

Organizers: A. Haque, V. Prakash

Session Chairs: J. P. M. Hoefnagels, A. Haque

- 12:35 USNCTAM2010-597: *Fracture between Functionalized Silicon Surfaces*, K. Liechti, S. R. Na, B. Doynov, A. Hassan, M. J. Krische
- 1:00 USNCTAM2010-959: *Coupled Effect of Size and Heterogeneity on Metal Plasticity*, J. Rajagopalan, T. Saif
- 1:25 USNCTAM2010-759: *Size-Effects in Time-Dependent Mechanics in Metallic MEMS*, J. P. M. Hoefnagels, L. I. J. C. Bergers, N. K. R. Delhey, M. G. D. Geers
- 1:50 USNCTAM2010-797: *On the Fracture Behavior of Nano-Layered Films under Tension*, H. Chai
- 2:15 USNCTAM2010-1176: *Adhesion and Friction at the Interfaces between ZnO Nanowires and Gold-Coated Surfaces*, Q. Qin, F. Xu, Y. Zhu

Concurrent Sessions—Thursday continued

4-4 Mechanics of Crystalline Nanostructures

RB207 4-4-7 Plasticity and Failure of Nanocrystalline Materials—III

12:35 p.m. – 2:40 p.m., Room 207

Organizers: H. Park, H. D. Espinosa

Session Chair: T. Li

- 12:35 USNCTAM2010-335: *A Criterion for Predicting Instabilities in Nanostructures*, J. Zimmerman, T. Delph
1:00 USNCTAM2010-391: *Plasticity and Failure in Nanocrystalline BCC Metals via MD Simulation*, R. E. Rudd
1:25 USNCTAM2010-608: *A Multiscale Cohesive Zone Model for Simulation of Polycrystalline Materials*, S. Li
1:50 USNCTAM2010-1096: *Origins of Large Variation in Ductility of Thin Nanocrystalline Metallizations on Polymer Substrates*, T. Li, Z. Zhang, B. Michaux
2:15 USNCTAM2010-321: *Multiscale Modeling of Surface-Driven Instabilities in Nanomaterials*, H. Park, G. Yun

4-8 Damage Mechanics of Solids and Structures

RB211 4-8-1 Damage Mechanics of Solids and Structures—I

12:35 p.m. – 2:40 p.m., Room 211

Organizer: R. K. Abu Al-Rub

Session Chair: R. K. Abu Al-Rub

- 12:35 USNCTAM2010-991: *A Straightforward Numerical Technique for Finite Element Implementation of Non-local Gradient-Dependent Continuum Damage Mechanics Theories*, R. K. Abu Al-Rub, M. Darabi, E. A. Masad
1:00 USNCTAM2010-1118: *Predicting Dwell Fatigue Failure in Polycrystalline Titanium Alloys Using a Wavelet Based Multi-Time Scale Method*, P. Chakraborty, M. Anahid, D. Joseph, S. Ghosh
1:25 USNCTAM2010-711: *Three Dimensional Remeshing Based Modelling of Crack Growth Using a Large Deformation Non-Local Ductile Damage Framework*, H. R. Javani Joni, R. Peerlings, M. G. D. Geers
1:50 USNCTAM2010-950: *Modeling Damage in Titanium Structures Subjected to Thermo-Chemo-Mechanical Environment*, C. Oskay
2:15 USNCTAM2010-705: *Fatigue Crack Initiation in Metallic Materials Using Critical Distance Methods*, S. Chattopadhyay

4-13 Structures and Devices with Multifunctional or Smart Materials: Design and Analysis

RB105 4-13-3 Soft Active Materials

12:35 p.m. – 2:40 p.m., Room 105

Organizers: A. Srinivasa, S. M. Srinivasan

Session Chair: A. Srinivasa

- 12:35 USNCTAM2010-644: *The Importance of Temperature Hysteresis in Yielding of Shape Memory Polymers: Two Case Studies*, P. Ghosh, A. Srinivasa
1:00 USNCTAM2010-1014: *A Large-Deformation Theory for Thermally-Actuated Shape-Memory Polymers and Its Application*, V. Srivastava, S. Chester, L. Anand
1:25 USNCTAM2010-1345: *Mechanics of Soft Active Materials with Phase Evolution*, K. Long, M. Dunn, J. Qi
1:50 USNCTAM2010-1363: *Modeling of Dynamic Characteristics of Isotropic Magnetorheological Gels*, V. P. Rao, S. M. Srinivasan
2:15 USNCTAM2010-1097: *Modeling of Dynamic Characteristics of Isotropic Magnetorheological Gels*, V. P. Rao, S. M. Srinivasan, A. Srinivasa

4-21 Mechanics of Dissimilar Materials Interfaces

RB218 4-21-2 Mechanics of Dissimilar Materials Interfaces—II

12:35 p.m. – 2:40 p.m., Room 218

Organizers: J. F. Davalos, A. Chen

Session Chairs: K. Wan, Teng Li

- 12:35 USNCTAM2010-832: *Adhesion Mechanics of a Compliant Cylinder*, J. Shi, S. Muftu, K. Wan
1:00 USNCTAM2010-834: *A Universal Parameter Governing Thin Film Adhesion*, K. Wan, G. Li
1:25 USNCTAM2010-859: *Experimental-Numerical Approach to Extract Intrinsic Interface Mechanical Properties from a Delamination Experiment*, N. K. Murthy, J. P. M. Hoefnagels, J. van Dommelen, M. G. D. Geers
1:50 USNCTAM2010-1376: *Modeling Conformal Contacts with Friction*, N. Sundaram, T. N. Farris
2:15 USNCTAM2010-1425: *Interfacial Stresses for Plated Reinforced Concrete Beams Using Simplectic Method*, A. Chen, P. Jiao, J. F. Davalos

4-25 Symposium Honoring Professor Robert M. McMeeking on the Occasion of His 60th Birthday

RB2 4-25-5 McMeeking—V

12:35 p.m. – 2:40 p.m., Deans Hall 2

Organizers: C. M. Landis, M. R. Begley

Concurrent Sessions—Thursday continued

Session Chairs: C. M. Landis, M. R. Begley

- 12:35 USNCTAM2010-771: *Fracture in Lithium-Ion Batteries*, Y. Hu, X. Zhao, Z. Suo
1:00 USNCTAM2010-853: *Failure of Heterogeneous and Active Media*, K. Bhattacharya
1:25 USNCTAM2010-1398: *Flexoelectricity*, P. Sharma
1:50 USNCTAM2010-1452: *A Statistical/Micromechanical Model for Hydrogen-Induced Intergranular Cracking*, P. Sofronis, P. Novak, R. Yuan, M. Dadfarinia, R. O. Ritchie, B. Somerday

4-29 Solid Mechanics as a Framework for Modeling New Phenomena

RB107 4-29-1 Solid Mechanics as a Framework for Modeling New Phenomena—I

12:35 p.m. – 2:40 p.m., Room 107

Organizers: A. Wineman, T. Pence

Session Chairs: A. Wineman, A. Vainchtein

- 12:35 USNCTAM2010-737: *Modeling Dissolution and Reassembly of Fibers in a Fiber Reinforced Hyperelastic Matrix*, H. Demirkoparan, T. Pence, A. Wineman
1:00 USNCTAM2010-537: *On Forming Flows of Ideal Fibre-Reinforced Resins When Fibres Resist Bending*, K. Soldatos
1:25 USNCTAM2010-1219: *Surface Interactions between Two Like-Charged Polyelectrolyte Gels*, W. Hong, X. Wang
1:50 USNCTAM2010-730: *Effect of Pattern Geometry on the Fracture Load of a Double Cantilever Beam Specimen with a Structured Interface*, H.-J. Kim-Lee, K. T. Turner
2:15 USNCTAM2010-606: *Modeling Rubber Materials Based on the Limited Polymeric Chain Extensibility*, P. A. Kakavas

4-31 Cyclic Plasticity of Materials: Experimentation and Constitutive Modeling at the Micro and Macroscopic Levels

RB108 4-31-2 Cyclic Plasticity—II

12:35 p.m. – 2:40 p.m., Room 108

Organizers: T. Hassan, C. Lissenden

Session Chairs: H. Dal, T. Hassan

- 12:35 USNCTAM2010-637: *Biaxial Ratchetting with Novel Variations of Kinematic Hardening Models*, Y. Dafalias, H. Feigenbaum

- 1:00 USNCTAM2010-521: *Micro-Sphere Based Formulation of Yield Surface Free Visco-Plasticity with Non-linear Kinematic Hardening: Application to Unvulcanized Rubber*, H. Dal, M. Kaliske
1:25 USNCTAM2010-381: *Suppression of Fatigue Crack Growth in Epoxy-Carbon Nanotube Nanocomposites*, C. Picu, N. Koratkar, W. Zhang
1:50 USNCTAM2010-542: *Towards Mechanism-Based Construction of Homogenized Plasticity Theory for Porous Materials: Micromechanics-Based Identification of Plastic Flow Mechanisms*, H. Khatam, M.-J. Pindera
2:15 USNCTAM2010-1282: *A Nonlocal Continuum Crystal Plasticity Accounting for Length-Scale Dependent Bauschinger Effect*, R. Aghababaei, S. Joshi

Dynamics

5-1 General

RB104 5-1-4 Vehicle Dynamics

12:35 p.m. – 2:40 p.m., Room 104

Organizer: J. Cusumano

Session Chair: J. Cusumano

- 12:35 USNCTAM2010-425: *Holonomic System Inverse Dynamics and Functional Optimization for Autonomous Ground Vehicle Applications*, V. Vantsevich
1:00 USNCTAM2010-527: *Pre-Test Analyses for Flight Flutter Test of an EASA CS-23 Aircraft*, M. Belardo, N. Paletta, M. Pecora
1:25 USNCTAM2010-625: *Effects of a Rolling Tire with Unbalance on the Response of a Hybrid Quarter Car Model*, K. Saeedi, R. B. Bhat

5-5 Dynamical Data Analysis of Multiscale Systems

RB3 5-5-2 Applications in Physics and Engineering

12:35 p.m. – 2:40 p.m., Senate 3

Organizers: D. Chelidze, J. Cusumano

Session Chairs: S. Bellizzi, L. Passmore

- 12:35 USNCTAM2010-1320: *Stochastic Multiscale Analysis of Turbulence*, R. Stresing, J. Peinke, J. C. Vassilicos
1:00 USNCTAM2010-1351: *Multiscale Damage Evolution as a Nucleation Phenomenon*, S. G. Abaimov, A. Roy, J. Cusumano
1:25 USNCTAM2010-1273: *Characterizing Time and Space Scales in Distributed Acceleration Signals in Slamming Aluminum Beam Structures*, I. Georgiou

Concurrent Sessions—Thursday continued

- 1:50 USNCTAM2010-1092: *Analysis of the Response and Identification of an Elastic Panel Coupled to Fluid*, D. Dessi, D. D'orazio, R. Mariani
2:15 USNCTAM2010-956: *Damage Assessment via Eigen-Transient Analysis of MOSFET Devices*, L. Passmore, J. Cusumano, O. O. Awadelkarim

Concurrent Sessions

Thursday C, 2:55 p.m. – 5:00 p.m.

Computational Methods

1-5 Theoretical and Computational Methods for Critical Material Behavior: Fracture, Dislocation, and Phase Transformation

RC112 1-5-4 Theoretical and Computational Methods for Critical Material Behavior—IV

2:55 p.m. – 5:00 p.m., Room 112

Organizers: M. Parks, Y. Chen, X. Li, S. A. Silling

Session Chair: M. Parks

- 2:55 USNCTAM2010-1297: *Crack Branching: Peridynamic Solutions for Dynamic Fracture Problems*, Y. D. Ha, F. Bobaru
3:20 USNCTAM2010-686: *Three-Dimensional, Self-Similar Scaling for Steady Crack Growth in Ductile Metals*, R. H. Dodds, J. Sobotka
3:45 USNCTAM2010-1070: *Void Growth and Coalescence in Dynamic Fracture from the Atomistic Level*, R. E. Rudd
4:10 USNCTAM2010-1065: *Controlled Self-Assembly of Charged Particle Monolayers*, N. Shestopalov, G. Henkelman, G. Rodin

Fluid Mechanics

2-7 Fluid Mechanics at the Nanoscale

RC203 2-7-1 Fluid Mechanics at the Nanoscale—I

2:55 p.m. – 5:00 p.m., Room 203

Organizer: I. K. Puri

Session Chair: F. Y. Leong

- 2:55 USNCTAM2010-1371: *Thermal Nanofluid Property Model with Application to Nanofluid Flow in a Parallel-Disk System*, Y. Feng, C. Kleinstreuer

- 3:20 USNCTAM2010-819: *Coupled Atomistic-Continuum Model for Lubricated Flexible Membranes*, F. Y. Leong
3:45 USNCTAM2010-626: *A Heterogeneous Multiscale Model for Interfacial Thermal Transport*, G. Balasubramanian, R. Kappiyoor, I. K. Puri

2-11 Non-Newtonian Flows

RC219 2-11-1 Non-Newtonian Flows—I

2:55 p.m. – 5:00 p.m., Room 219

Organizers: P. Singh, A. J. Kadaksham

Session Chair: P. Singh

- 2:55 USNCTAM2010-912: *Jetting and Breakup of Weakly Viscoelastic Liquids*, A. Ardekani, V. Sharma, G. McKinley
3:20 USNCTAM2010-1204: *Thin Films and Fingering Problems in Complex Flows*, P. Daripa
3:45 USNCTAM2010-635: *Modeling of Blood Flow in the Human Brain*, M. S. Hossain, B. Dalal, I. Fischer, P. Singh, N. Aubry
4:10 USNCTAM2010-783: *Destabilization of Pickering Emulsions Using Vibrations*, J. Cuadra, P. Singh, A. D. Rosato
4:35 USNCTAM2010-1245: *Stability Enhanced Models of Chemical Enhanced Oil Recovery Processes*, P. Daripa

2-13 Respiratory Fluid Mechanics

RC205 2-13-4 Airway Closure and Reopening—II

2:55 p.m. – 5:00 p.m., Room 205

Organizer: J. B. Grotberg

Session Chair: D. Halpern

- 2:55 USNCTAM2010-585: *Penetration Pattern in Networks of Connected Channels*, Y. Song, P. Manneville, C. N. Baroud
3:20 USNCTAM2010-671: *Two-Phase Flow in Pulmonary Airways*, B. Vaughan, P. Zamankhan, J. B. Grotberg
3:45 USNCTAM2010-678: *Experimental and Numerical Studies of Flow Fields in an Airway Closure Model*, S. Bian, C. Tai, D. Halpern, Y. Zheng, J. B. Grotberg
4:10 USNCTAM2010-788: *The Effect of Surfactant on Airway Recruitment in Obstructive Lung Disease*, D. Halpern, D. P. Gaver III
4:35 USNCTAM2010-958: *High-Frequency Self-Excited Oscillations in Collapsible Tube Flows*, R. Whittaker, S. Waters, O. Jensen, J. Boyle, M. Heil

Concurrent Sessions—*Thursday continued*

Biomechanics

3-5 Mechanics and Biology

RC1 3-5-3 Constitutive Models for Development, Growth and Remodeling

2:55 p.m. – 5:00 p.m., Deans Hall 1

Organizer: S. Cowin

Session Chair: J. Holmes

- 2:55 USNCTAM2010-393: *Structure and Mechanisms of Soft Tissues Rheology and Remodeling*, Y. Lanir
- 3:20 USNCTAM2010-1352: *A Generalized Soft Tissue Structural Constitutive Model That Elucidates Key Remodeling Phenomena*, M. Sacks, S. Wognum
- 3:45 USNCTAM2010-411: *Reverse Engineering the Mechanics of a Self-Deforming Tissue*, L. Davidson
- 4:10 USNCTAM2010-394: *Mechanics of Head Fold Morphogenesis*, V. D. Varner, L. A. Taber
- 4:35 USNCTAM2010-710: *Biomechanical Studies of Reproductive Events During Early Human Life*, D. Elad

3-6 Molecular and Cellular Biomechanics: Adhesion, Cell-ECM Interaction, and Mechanotransduction

RC208 3-6-9 Hair Bundle Mechanotransduction

2:55 p.m. – 5:00 p.m., Room 208

Organizers: S. Zhang, G. Bao, H. Gao, K. J. Hsia, J. Li, K. Grosh

Session Chair: K. Grosh

- 2:55 USNCTAM2010-561: *Fluid-Structure Interaction in the Hair-Bundle Modelled by the Finite-Element Method*, J. Baumgart, M. Fleischer, A. Voigt
- 3:20 USNCTAM2010-745: *Computational Study on Organ of Corti Deformation Due to Outer Hair Cell Generated Forces*, J.-H. Nam, R. Fettiplace
- 3:45 USNCTAM2010-952: *Role of Mammalian Outer Hair Cell Hair Bundle Filtering and Motility in Cochlear Mechanics*, J. Meaud, K. Grosh
- 4:10 USNCTAM2010-1429: *Hair Cells as Sensory Receptors and Mechanical Amplifiers for Hearing*, P. Martin, J. Barral, K. Dierkes, B. Lindner, F. Jülicher
- 4:35 USNCTAM2010-1430: *Hearing in Drosophila—Dissecting the Functional Workings of an Ear*, M. Göpfert, B. Nadrowski

3-9 Biological Materials and Constituents from Nano to Macro

RC206 3-9-5 Nano to Macro—V

2:55 p.m. – 5:00 p.m., Room 206

Organizers: M. J. Buehler, L. Dorfmann

Session Chair: P. Purohit

- 2:55 USNCTAM2010-1063: *Neuronal Mechanics of Memory and Learning*, S. Siechen, S. Yang, A. Chiba, T. Saif
- 3:45 USNCTAM2010-1164: *Smart Matrix: The Role of Mechanochemistry and Molecular Crowding in Producing Optimized Structural Materials in Vertebrates*, J. Ruberti, N. Saeidi, R. Zareian, B. P. Flynn, R. J. Camp
- 4:10 USNCTAM2010-1353: *Development of a ReaxFF Reactive Force Field for Simulating Chemical Reactions in Proteins*, A. van Duin
- 4:35 USNCTAM2010-703: *Regional Mechanical Properties of the Rat Brain Measured with the Atomic Force Microscope*, B. Morrison, B. S. Elkin

3-11 Mechanics of Traumatic Brain Injury

RC4 3-11-2 Traumatic Brain Injury—II

2:55 p.m. – 5:00 p.m., Senate 2

Organizers: L. Gu, N. Chandra

Session Chairs: A. Leung, L. Gu

- 2:55 USNCTAM2010-501: *Simulation and Correlation of Blast-Induced, Early-Time Intracranial Wave Physics with Traumatic Brain Injury*, P. A. Taylor, C. C. Ford
- 3:20 USNCTAM2010-704: *Changes in Electrophysiological Function after Controlled Deformation of Slice Cultures of the Hippocampus*, B. Morrison, Z. Yu, W. H. Kang
- 3:45 USNCTAM2010-1005: *Strain Rate Dependent Response of Brain Tissue Measured by MR Elastography*, E. Clayton, J. Garbow, P. Bayly
- 4:10 USNCTAM2010-1200: *Displacement Fields in the Human Brain Measured with Respect to the Skull During Mild Impact*, Y. Feng, T. M. Abney, R. J. Okamoto, R. Pless, G. Genin, P. Bayly
- 4:35 USNCTAM2010-1021: *Computational Modeling of the Brain Response to a Blast Pressure Wave*, A. Leung, K. Simmonds, A. Bagchi, P. Matic

Concurrent Sessions—Thursday continued

Mechanics of Materials and Structures

4-1 General

RC109 4-1-4 Mechanics of Materials & Structures—IV

2:55 p.m. – 5:00 p.m., Room 109

Organizer: C. Bakis

Session Chair: G. Rodin

- 2:55 USNCTAM2010-777: *Measurement of Residual Stress in Shot-Peened 4140M and Structural (Pipeline) Steel Specimens by Wavelet-Analysis Enhanced X-Ray Diffraction and Modified Hole Drilling Methods*, G. Roy
- 3:20 USNCTAM2010-677: *The R-Curve Near the Threshold for Subcritical Crack Growth*, G. Rodin, H. Zhao
- 4:10 USNCTAM2010-602: *Nonconvex Inequality Models for Contact Problems of Nonsmooth Viscoelasticity*, S. Migorski
- 4:35 USNCTAM2010-309: *The Contact Stress of the Tooth Surface with Equal Conjugate Curvature*, L. Huran

4-3 Multi-Physics of Nanoscale Materials and Interfaces

RC106 4-3-3 Multiphysics of Materials & Interfaces—III

2:55 p.m. – 5:00 p.m., Room 106

Organizers: A. Haque, V. Prakash

Session Chairs: H. Jiang, A. Haque

- 2:55 USNCTAM2010-1029: *Mechanochemically Active Polymeric Materials*, N. Sottos, B. Beiermann, C. Kingsbury, S. Kramer, D. Davis, J. Moore, S. R. White
- 3:20 USNCTAM2010-1015: *Mechanobiology of Stem Cells—A Case Study in Mechananomics*, M. K. Tate, H. Chang, M. J. Song
- 3:45 USNCTAM2010-880: *A Finite Element Method for Transient Analysis of Concurrent Large Deformation and Mass Transport in Gels*, H. Jiang, J. Zhang, X. Zhao, Z. Suo
- 4:10 USNCTAM2010-769: *A Theory of Constrained Swelling of a PH-Sensitive Hydrogel*, R. Marcombe, S. Cai, W. Hong, X. Zhao, Y. Lapusta, Z. Suo

4-4 Mechanics of Crystalline Nanostructures

RC207 4-4-8 Plasticity and Failure of Nanocrystalline Materials—IV

2:55 p.m. – 5:00 p.m., Room 207

Organizers: H. Park, H. D. Espinosa

Session Chair: L. Xiong

- 2:55 USNCTAM2010-341: *Surface Effects in Polycrystalline Plasticity*, W. Walsh
- 3:20 USNCTAM2010-358: *Non-Uniqueness in Energy Minimization of Atomistic Problems: A Branch-Following and Bifurcation Investigation*, T. Sendova, E. B. Tadmor, R. Elliott
- 3:45 USNCTAM2010-845: *Concurrent Atomistic-Continuum Simulation of Nanocrystalline Materials*, L. Xiong, Y. Chen
- 4:10 USNCTAM2010-1150: *A PDE Model of Coupled Phase Transformation and Plasticity*, R. Singh, A. Acharya, K. Dayal
- 4:35 USNCTAM2010-1041: *Can Nanoindentation Measure Unique Elastoplastic Properties of Materials?* X. Chen, L. Liu

4-8 Damage Mechanics of Solids and Structures

RC211 4-8-2 Damage Mechanics of Solids and Structures—II

2:55 p.m. – 5:00 p.m., Room 211

Organizer: R. K. Abu Al-Rub

Session Chair: C. Oskay

- 2:55 USNCTAM2010-914: *Damage Induced Dynamic Heating in Brittle Materials*, J. Pitt, F. Costanzo
- 3:20 USNCTAM2010-515: *A Comparative Experimental Study to Evaluate Fracture Process Zone in Concrete*, H. Haddad, J.-F. Thimus, M. Chabaat
- 3:45 USNCTAM2010-709: *Effect of Nanoscale Plasticity Mechanisms on the Brittle Fracture of Metallic Glasses*, M. Palla, G. Tianfu, Y. Li, Y. W. Zhang, H. Gao
- 4:10 USNCTAM2010-1153: *Fracture of Metallic Glasses at Notches*, D. Henann, L. Anand
- 4:35 USNCTAM2010-1247: *Finite Element Simulation of Single Carbon Nanotube Pull-Outs from a Cementitious Nanocomposite Material Using a Plasticity-Damage and Cohesive Zone Models*, R. K. Abu Al-Rub, S.-M. Kim

Concurrent Sessions—*Thursday continued*

4-13 Structures and Devices with Multifunctional or Smart Materials: Design and Analysis

RC105 4-13-4 Multifunctional/Smart Material Devices—Computations

2:55 p.m. – 5:00 p.m., Room 105

Organizers: A. Srinivasa, S. M. Srinivasan

Session Chair: S. M. Srinivasan

- 2:55 USNCTAM2010-342: *Vibration Suppression of an Elastic Plate by Use of an Electrorheological Patch and Constraining Layer*, M. E. Aryaee Panah, M. Hasheminejad, N. Najafi
- 3:20 USNCTAM2010-969: *Variational Equations of Functionally Graded Polar Piezoelectric Structural Elements*, M. C. Dökmeci
- 3:45 USNCTAM2010-579: *Magnetic Scalar and Vector Potential Approaches in Dynamic Response Studies of Magneto-Electro-Elastic 3D Solids*, B. Biju, N. Ganesan, K. Shankar
- 4:10 USNCTAM2010-1196: *Design of Multifunctional Materials Using Topology Optimization with Feature Control*, J. Guest

4-20 Mechanics of Advanced Infrastructure Materials

RC218 4-20-1 Mechanics of Advanced Infrastructure Materials—I

2:55 p.m. – 5:00 p.m., Room 218

Organizers: J. F. Davalos, A. Chen

Session Chairs: Z. Hu, E. M. Sosa

- 2:55 USNCTAM2010-1206: *A General Approach to Obtain Electromagnetic Field Analytical Solutions and Applications to Multifunctional Composite Design*, S. Hao
- 3:20 USNCTAM2010-1419: *Development of Inflatable Systems for Infrastructure Protection: Resilient Tunnel Concept*, J. F. Davalos, E. J. Barbero, E. M. Sosa, J. Martinez, W. Huebsch, K. Means, L. Banta, G. Thompson, D. Martinelli
- 3:45 USNCTAM2010-1420: *Corrugated Wood Composite Web Panel for I-Joist Using Discarded Veneer-Mill Residues*, J. F. Davalos, B. McGraw, A. Chen, L. Denes, E. M. Lang
- 4:10 USNCTAM2010-1426: *Stress Intensity Factor Computation for Bi-Material Interface by Scaled Boundary Finite Element Method*, J. Liu, G. Lin, Z. Hu

- 4:35 USNCTAM2010-1428: *Effect of Sustained Load on Bond of Fiber Reinforced Polymer Composites to Concrete*, Y. Jeong, A. Jaipurian, C. Bakis, M. M. Lopez

4-25 Symposium Honoring Professor Robert M. McMeeking on the Occasion of His 60th Birthday

RC2 4-25-6 McMeeking—VI

2:55 p.m. – 5:00 p.m., Deans Hall 2

Organizers: C. M. Landis, M. R. Begley

Session Chairs: C. M. Landis, M. R. Begley

- 2:55 USNCTAM2010-426: *On the Constitutive Modeling of Skeletal Muscle and Tendon Tissues*, L. Spyrou, N. Aravas
- 3:20 USNCTAM2010-493: *Size-Dependent Elastic/Inelastic Behavior of Enamel Over Millimeter and Nanometer Length Scales*, G. Schneider
- 3:45 USNCTAM2010-932: *Molecular Analysis of Proteins and Subcellular Structures*, G. Bao
- 4:10 USNCTAM2010-1361: *The Mechanics of Pulsatile Swimmers (Salp and Squid)*, M. Begley, H. Bart-Smith, H. Haj-Hariri, M. Utz
- 4:35 USNCTAM2010-1451: *Bio-Inspired Materials with Periodic Microstructures*, R. O. Ritchie, M. Begley

4-29 Solid Mechanics as a Framework for Modeling New Phenomena

RC107 4-29-2 Solid Mechanics as a Framework for Modeling New Phenomena—II

2:55 p.m. – 5:00 p.m., Room 107

Organizers: A. Wineman, T. Pence

Session Chairs: H. Demirkoparan, J. Rao

- 2:55 USNCTAM2010-699: *Swelling Induced Deformation: The Example of Torsion*, T. Pence, H. Demirkoparan, X. Tan, Y. Fang
- 3:20 USNCTAM2010-505: *Effect of Nonlinearity on the Steady Motion of a Twinning Dislocation*, A. Vainchtein
- 3:45 USNCTAM2010-1116: *A Large Deformation Theory for Thermo-Chemo-Mechanically Coupled Polymeric Gels*, S. Chester, L. Anand
- 4:10 USNCTAM2010-1374: *An Analytical Model of Interfacial Dissipation in MEMS-Based Piezoelectric Block Resonators*, Z. Hao
- 4:35 USNCTAM2010-366: *General Mathematical Models of Micropolar Thin Elastic Bars, Plates and Shells*, S. Sargsyan

Concurrent Sessions—*Thursday continued*

4-31 Cyclic Plasticity of Materials: Experimentation and Constitutive Modeling at the Micro and Macroscopic Levels

RC108 4-31-3 Cyclic Plasticity—III

2:55 p.m. – 5:00 p.m., Room 108

Organizers: T. Hassan, C. Lissenden

Session Chairs: H. Feigenbaum, C. Lissenden

2:55 USNCTAM2010-633: *Novel Modeling Features for Enhancing Hysteresis Response Simulations of the Chaboche Model*, T. Hassan, S. Krishna

3:45 USNCTAM2010-664: *Convexity of Yield Surface with Directional Distortional Hardening*, H. Feigenbaum, J. Plesek, Y. Dafalias

4:10 USNCTAM2010-802: *Yield Surface Evolution for Particle and Fiber Reinforced Aluminum Metal Matrix Composites*, C. Lissenden

4:35 USNCTAM2010-1044: *Modeling Cyclic Response of Structural Steels with Yield Plateau under Dynamic Loading*, A. Ucak, D. R. Hufner, K. Arpin, P. Tsopelas

Dynamics

5-3 Recent Advances in Nonlinear Dynamics

RC104 5-3-1 Advances in Nonlinear Dynamics—I

2:55 p.m. – 5:00 p.m., Room 104

Organizers: T. Peacock, C. Rowley

Session Chairs: W. Tang, C. Rowley

2:55 USNCTAM2010-376: *How to Grow or Fill a Hole: Cavitation and Aniticavitation in Growing Elastic Materials*, A. Goriely, D. E. Moulton

3:20 USNCTAM2010-843: *Finite Size Expansion for High Dimensional Systems*, M. Buice, C. Chow

3:45 USNCTAM2010-1267: *Resonant Acceleration of Electrons by Electromagnetic Waves in the Earth's Magnetotail*, D. Vainchtein, A. Neishtadt, A. Vasiliev

4:10 USNCTAM2010-594: *Controlling Neurons*, J. Moehlis

4:35 USNCTAM2010-392: *Swarming Dynamics in Bacterial Colonies*, H. Zhang, A. Be'er, E. L. Florin, H. L. Swinney

5-5 Dynamical Data Analysis of Multiscale Systems

RC3 5-5-3 Applications in Biology and Medicine

2:55 p.m. – 5:00 p.m., Senate 3

Organizers: D. Chelidze, J. Cusumano

Session Chairs: M. Liu, J. John

2:55 USNCTAM2010-1392: *Data Assimilation and Model Based Control of Seizures and Parkinson's Disease*, S. Schiff

3:20 USNCTAM2010-899: *Multiscale Analysis of Biological Signals*, J. Gao, J. Hu, W. Tung

3:45 USNCTAM2010-904: *Nonlinear Smooth Orthogonal Decomposition of Sawing Motion Kinematics Features Identifies Local Muscle Fatigue Dynamics*, D. Segala, D. H. Gates, D. Chelidze, J. Dingwell

4:10 USNCTAM2010-1307: *Complex Modal Decomposition Analysis of Nematode Posturing*, B. Feeny, P. Sternberg, C. Cronin

CONCURRENT SESSIONS

Friday, July 2

Concurrent Sessions

Friday A, 9:15-11:20 a.m.

Fluid Mechanics

FA203 2-7-2 Fluid Mechanics at the Nanoscale—II

2-7 Fluid Mechanics at the Nanoscale

9:15 a.m. – 11:20 a.m., Room 203

Organizers: I. K. Puri

Session Chair: G. Balasubramanian

- 9:15 USNCTAM2010-589: *A Nanoaquarium for Real-Time Imaging of Fluid and Particle Transport with Electron Microscopy*, J. Grogan, H. Bau
- 9:40 USNCTAM2010-1024: *Numerical Simulations of Knudsen Forces in Microsystems*, J. Nabeth, S. Chigullapalli, A. Alexeenko
- 10:05 USNCTAM2010-1188: *Wetting Transition on Physically-Patterned Surfaces*, H. Wu, A. Shahraz, K. Fichthorn, A. Borhan
- 10:30 USNCTAM2010-1192: *Ion Steric Effects on the Double Layer Polarization of a Nanoparticle in an AC Field*, H. Zhao
- 10:55 USNCTAM2010-1373: *Effect of Concentration on the Hydration of Magnesium Sulfate in Water*, G. Balasubramanian, S. Murad, R. Kappiyoor, I. K. Puri

2-11 Non-Newtonian Flows

FA219 2-11-2 Non-Newtonian Flows—II

9:15 a.m. – 11:20 a.m., Room 219

Organizers: P. Singh, A. J. Kadaksham

Session Chair: A. J. Kadaksham

- 9:15 USNCTAM2010-753: *Rheology of a Suspension of Deformable Elastic Particles in a Viscous Shear Flow*, T. Gao, H. Hu, P. Ponte Castaneda
- 9:40 USNCTAM2010-641: *Effects of Viscosity Ratio on the Transient and Steady Deformation of a Newtonian Drop in a Viscous and Viscoelastic Matrix under Shear Flow*, S. Afkhami, Y. Renardy, M. Renardy
- 10:05 USNCTAM2010-1074: *Three-Dimensional Imaging of Electrospun Fibers*, R. Sahay, T. C. Juay, Y. T. Chew
- 10:30 USNCTAM2010-454: *Spontaneous Dispersion of Particles on Liquid Surfaces*, S. Gurupatham, B. Dalal, S. C. Nudurupati, I. Fisher, P. Singh, D. Joseph

2-13 Respiratory Fluid Mechanics

FA205 2-13-5 Respiratory Transport and Structure Interactions

9:15 a.m. – 11:20 a.m., Room 205

Organizer: J. B. Grotberg

Session Chair: C.-L. Lin

- 9:15 USNCTAM2010-731: *Comparing Convective and Diffusive Lengths for Gas Transport in the Pulmonary Acinus*, J. Sznitman
- 9:40 USNCTAM2010-787: *Prediction of Ozone Dose Distribution in an Anatomically-Accurate Model of the Respiratory Tract*, B. Keshavarzi, J. S. Ultman, E. M. Postlethwait, A. Borhan
- 10:05 USNCTAM2010-800: *The Role of Branching Asymmetry in the Ventilation Performance of the Lung*, M. Florens, B. Sapoval, M. Filoche
- 10:30 USNCTAM2010-901: *Multiscale Modeling of Human Respiration*, R. Kunz
- 10:55 USNCTAM2010-916: *Multiscale Simulation of Airflow in the CT-Based Human Airways and Its Application to Particle Transport*, C.-L. Lin, J. Choi, Y. Yin, A. R. Lambert, M. H. Tawhai, E. A. Hoffman

Biomechanics

3-1 General

FA112 3-1-1 Biomechanics—General

9:15 a.m. – 11:20 a.m., Room 112

Organizer: C. Bakis

Session Chair: Corina Drapaca

- 9:15 USNCTAM2010-365: *Multi-Scale and Low-Dimensional Red Blood Cell Models with Accurate Mechanics, Rheology and Dynamics*, W. Pan, D. Fedosov, B. Caswell, G. Karniadakis
- 9:40 USNCTAM2010-837: *The Mechanics of Atherosclerotic Plaque Rupture by Inclusion/Matrix Interfacial Decohesion in a Layer*, C. Nguyen, A. Levy
- 10:05 USNCTAM2010-1151: *Computational-Experimental Analyses of Y-90 Microsphere Targeting in a Representative Hepatic Artery System with Tumor*, C. A. Basciano, E. Boros, E. Childress, G. D. Buckner, C. Kleinstreuer, A. S. Kennedy, W. A. DeZarn

Concurrent Sessions—Friday continued

3-5 Mechanics and Biology

FA1 3-5-4 Fluid and Solid Interaction in Tissue

9:15 a.m. – 11:20 a.m., Deans Hall 1

Organizer: S. Cowin

Session Chair: Larry A. Taber

- 9:15 USNCTAM2010-x: *Canonical Problems of Surface and Volume Growth: Dissolution of Porous Scaffolds*, G. A. Ateshian
- 9:40 USNCTAM2010-1154: *Osmotic Forces in Cartilaginous Tissues*, J. Huyghe, R. Roos
- 10:05 USNCTAM2010-698: *Transport of Fluid and Solutes in Biological Soft Tissues*, W. Gu, X. Chen, F. Travascio, C.-Y. Huang, G. Zha
- 10:30 USNCTAM2010-370: *Fabric Dependence of Poroelastic Wave Propagation in Bone Tissue*, S. Cowin, L. Cardoso
- 10:55 USNCTAM2010-871: *Characterization and Multi-Scale Modeling of Elastic Moduli of Cortical Bone*, I. Jasiuk, E. Hamed, Y. H. Lee, L. Feng

3-6 Molecular and Cellular Biomechanics: Adhesion, Cell-ECM Interaction, and Mechanotransduction

FA208 3-6-10 Cell Membrane Transduction and Sensing

9:15 a.m. – 11:20 a.m., Room 208

Organizers: S. Zhang, G. Bao, H. Gao, K. J. Hsia, J. Li, K. Grosh

Session Chair: K. Grosh

- 9:15 USNCTAM2010-1431: *Piezoelectric Characterization of Prestin, the Membrane Motor in Outer Hair Cells*, K. H. Iwasa
- 9:40 USNCTAM2010-482: *Effect of Membrane Mechanics on Charge Transfer Associated with the Membrane Protein Prestin*, N. Nilsen, W. E. Brownell, S. Sun, A. A. Spector
- 10:05 USNCTAM2010-488: *Computational Modeling of the Mechanics of Tethers Pulled from Cellular Membranes*, C. Lau, W. E. Brownell, A. A. Spector
- 10:30 USNCTAM2010-1119: *Investigation of Oocyte Deformability Using Micropipette Aspiration Method*, M. Karzar-Jeddi, J. Diaz, N. Olgac, T.-H. Fan
- 10:55 USNCTAM2010-1405: *Immunomagnetic Nano-Screening Chip for Circulating Tumor Cells Detection in Blood*, X. Zhang

3-9 Biological Materials and Constituents from Nano to Macro

FA206 3-9-6 Nano to Macro—VI

9:15 a.m. – 11:20 a.m., Room 206

Organizers: M. J. Buehler, L. Dorfmann

Session Chair: B. Morrison

- 9:15 USNCTAM2010-1183: *Synthesis, Functionalization and Optimization of Magnetic Nanoparticles for Molecular Imaging*, G. Bao, S. Tong, S. Hou
- 9:40 USNCTAM2010-723: *Error Estimation of Nanoindentation Mechanical Properties Near a Bone-Implant Interface via Finite Element Analysis and Analytical Solution Methods*, Y. Zhao, T. Ovaert
- 10:05 USNCTAM2010-1017: *Periosteal Mechanics from the Macro to Nano Scales*, S. McBride, U. Knothe, S. Brianza, S. Dolejs, M. K. Tate
- 10:55 USNCTAM2010-1042: *Mechanics vs. Morphogenesis*, J. Yin, X. Chen, C. Xi

3-11 Mechanics of Traumatic Brain Injury

FA4 3-11-3 Traumatic Brain Injury—III

9:15 a.m. – 11:20 a.m., Senate 2

Organizers: L. Gu, N. Chandra

Session Chairs: N. Chandra, L. Gu

- 9:15 USNCTAM2010-722: *Mechanical Response of Gel Stimulants for Brain Tissues*, F. Pervin, W. Chen
- 9:40 USNCTAM2010-1169: *Computational Simulation of the Deformation of Neuronal Cells*, G. Cao, Y. Zhou, J. S. Lee, J. Y. Lim, N. Chandra
- 10:05 USNCTAM2010-1259: *Shear Wave Propagation in Inhomogeneous and Anisotropic Gels—Computational and Experimental Studies Relevant to Brain Trauma*, R. Namani, E. Van Houten, P. V. Bayly
- 10:30 USNCTAM2010-1372: *Blast-Induced Traumatic Brain Injury Research at Lawrence Livermore National Laboratory*, W. Moss, M. King, R. E. Pierce
- 10:55 USNCTAM2010-822: *MRI-Based Finite Element Modeling of Head Trauma: Spherically Focusing Shear Waves*, Y. Chen, M. Ostojca-Starzewski

Concurrent Sessions—Friday continued

Mechanics of Materials and Structures

4-1 General

FA109 4-1-5 Mechanics of Materials & Structures—V

9:15 a.m. – 11:20 a.m., Room 109

Organizer: C. Bakis

Session Chair: W. Yu

9:15 USNCTAM2010-1140: *Generalized Timoshenko Model of the Variational Asymptotic Beam Sectional Analysis*, W. Yu, D. Hodges, J. Ho

9:40 USNCTAM2010-632: *Numerical Computation of Asymmetric Ludwick Cantilever Beam in Large Deformation*, A. Borboni, D. De Santis, R. Faglia

10:05 USNCTAM2010-1387: *IP Theory for Crack Initiation*, V. G. Ukadgaonker

10:30 USNCTAM2010-1389: *Stress Analysis of Two Unequal Cracks Emanating from Two Unequal Circular Rivets*, V. G. Ukadgaonker

10:55 USNCTAM2010-1069: *A Theoretical Analysis of a Transversely Isotropic Full-Space under Rocking Vibration*, A. Mirzapour, M. Eskandari-Ghadi, A. Ardeshir-Behrestaghi

4-3 Multi-Physics of Nanoscale Materials and Interfaces

FA106 4-3-4 Multiphysics of Materials & Interfaces—IV

9:15 a.m. – 11:20 a.m., Room 106

Organizers: A. Haque, V. Prakash

Session Chairs: X. Chen, A. Haque

9:15 USNCTAM2010-1040: *Science Underpinning Nanofluidic Energy Conversion*, X. Chen, L. Liu

9:40 USNCTAM2010-487: *Stress-Dependent Chemical Potentials and Their Applications to Crystalline Solids*, J. Qu

10:05:USNCTAM2010-879: *Controlled Carbon Nanotube Junctions Self-Assembled from Graphene Nanoribbons*, H. Jiang

10:30 USNCTAM2010-761: *Melt-Dispersion Mechanism for Reaction of Aluminum Nanoparticles*, V. I. Levitas

10:55 USNCTAM2010-1226: *Sustained Cantilever Oscillations between Tungsten and Charged Mica in Humid Environments*, D. Xu, K. Liechti, K. Ravi-Chandar

4-4 Mechanics of Crystalline Nanostructures

FA207 4-4-9 Plasticity and Failure of Composites, Biomaterials, Alloys—II

9:15 a.m. – 11:20 a.m., Room 207

Organizers: H. Park, H. D. Espinosa

Session Chair: A. Haque

9:15 USNCTAM2010-475: *Nanostructure of a Biphenyl-cyclohexane-Based Liquid-Crystal Molecular System*, M. L. Liao, S. P. Ju, C. I. Chang, W. L. Huang

9:40 USNCTAM2010-995: *Deformation Mechanism of Single and Polycrystalline Aragonite under Tension and Nanoindentation*, N. Zhang, Y. Chen

10:05 USNCTAM2010-1205: *A Multi-Scale Model of Intergranular Fracture and Computer Simulation of Fracture Toughness of a Carburized Steel*, S. Hao

10:30 USNCTAM2010-410: *Coupling of Physical Domains at the Nanoscale*, A. Haque

4-8 Damage Mechanics of Solids and Structures

FA211 4-8-3 Damage Mechanics of Solids and Structures—III

9:15 a.m. – 11:20 a.m., Room 211

Organizer: R. K. Abu Al-Rub

Session Chair: M. Darabi

9:15 USNCTAM2010-1148: *Statistical Modeling of Fatigue Crack Growth in Fastener Holes*, D. G. Harlow

9:40 USNCTAM2010-1066: *Spacetime Interfacial Damage Model for Elastodynamic Fracture with Riemann Contact Conditions*, R. Abedi, R. Haber

10:05 USNCTAM2010-924: *Failure Modes of Fiber-Reinforced Composites under Impact Loading*, Y. Chen, S. Ghosh

10:30 USNCTAM2010-329: *3-D Rail-Wheel Contact Analysis Using FEA*, M. A. Arslan, O. Kayabasi

4-13 Structures and Devices with Multifunctional or Smart Materials: Design and Analysis

FA105 4-13-5 Multifunctional/Smart Composites

9:15 a.m. – 11:20 a.m., Room 105

Organizers: A. Srinivasa, S. M. Srinivasan

Session Chair: A. Srinivasa

9:15 USNCTAM2010-1330: *Vascular Networks for Self-Healing FRP Composite Laminates*, I. Bond, C.-Y. Huang, R. Trask

9:40 USNCTAM2010-1331: *Bio-Inspired Engineering Study of Plantae Vascules for Self-Healing Composite Structures*, R. Trask, I. Bond

Concurrent Sessions—Friday continued

- 10:05 USNCTAM2010-359: *Nonlinear Bending Analysis of Composite Plates Embedded with Shape Memory Fibers*, F. Alinejad, M. Shariyat, A. Jafari
- 10:30 USNCTAM2010-890: *Temperature and Time Effects in the Electro-Mechanical Coupling Behavior of Active Fiber Composites*, H. Ben Atitallah, Z. Ounaies, A. H Muliana
- 10:55 USNCTAM2010-1003: *Modeling and Design of Microvascular Materials for Active Cooling Applications*, P. H. Geubelle, A. Aragón, S. Soghrati, B. Kozola, S. R. White

4-15 Thermoelasticity, Thermal Stresses, and Thermal Shock

FA108 4-15-1 Thermal Response of Materials and Structures

9:15 a.m. – 11:20 a.m., Room 108

Organizers: A. E. Segall, R. K. Akarapu

Session Chair: R. K. Akarapu

- 9:15 USNCTAM2010-334: *Effects of Cooling Rate on the Thermal Fracture of a Functionally Graded Plate*, Z. Jin
- 9:40 USNCTAM2010-694: *Inelastic Deformation in Multilayer Microcantilevers with Nanoscale Coating*, I.-K. Lin, X. Zhang, Y. Zhang
- 10:05 USNCTAM2010-795: *On the Use of a Mesh-Free Method in 3D Simulation of Heat Transfer and Residual Stress Generation in Arc Welding Processes*, R. Das, P. W. Cleary
- 10:30 USNCTAM2010-673: *The Inverse Determination of Boundary Conditions Using a Least-Squares Approach for Both Linear and Nonlinear Problems*, A. E. Segall, C. Drapaca, D. Engels

4-20 Mechanics of Advanced Infrastructure Materials

FA218 4-20-2 Mechanics of Advanced Infrastructure Materials—II

9:15 a.m. – 11:20 a.m., Room 218

Organizers: J. F. Davalos, A. Chen

Session Chairs: I. Ray, Q. Dai

- 9:15 USNCTAM2010-1402: *Two- and Three-Dimensional Micromechanical Constitutive Modeling of Heterogeneous Infrastructure Materials with X-Ray Computed Tomography Images*, Q. Dai

- 9:40 USNCTAM2010-1404: *Cohesive Fracture Simulation of Micro-Damage Within Heterogeneous Infrastructure Materials*, Q. Dai, K. Ng
- 10:05 USNCTAM2010-1421: *Matrix Cracking in Laminated Composites of General Stacking Sequence under General Loading*, E. J. Barbero, A. Adumitroaie
- 10:30 USNCTAM2010-1422: *Mixed Mode Fracture of Wood-FRP Bonded Interfaces by Four-Point Asymmetric End-Notched Flexure Specimen*, P. Qiao, F. Chen
- 10:55 USNCTAM2010-1424: *Restrained Shrinkage Cracking of Self-Consolidating Concrete*, A. Bhattacharya, I. Ray, J. F. Davalos, A. Chen

4-26 Experimental Fracture Mechanics

FA2 4-26-1 Experimental Fracture Mechanics

9:15 a.m. – 11:20 a.m., Deans Hall 2

Organizer: C. Bakis

Session Chair: S. Hong

- 9:15 USNCTAM2010-796: *The Use of Subsurface Tunneling Radial Cracks as a Means for Evaluating Fracture Toughness of Brittle Layers*, H. Chai
- 9:40 USNCTAM2010-852: *Extracting Traction-Separation Laws in Cohesive-Zone Model from Full-Field Measurement of Crack-Tip Deformation Fields*, S. Hong, K.-S. Kim
- 10:05 USNCTAM2010-860: *An Advanced Experimental Approach for Detailed In-Situ Characterization of Interface Delamination*, N. K. Murthy, J. P. M. Hoefnagels, J. van Dommelen, M. G. D. Geers
- 10:30 USNCTAM2010-866: *In-Situ TEM Fracture Testing of Nanoscale Thin Films*, S. Kumar, A. Haque
- 10:55 USNCTAM2010-1264: *Analysis of the Double Cleavage Drilled Compression (DCDC) Fracture Test*, A. V. Amirkhizi, C. Nielsen, S. Nemat-Nasser

4-29 Solid Mechanics as a Framework for Modeling New Phenomena

FA107 4-29-3 Solid Mechanics as a Framework for Modeling New Phenomena—III

9:15 a.m. – 11:20 a.m., Room 107

Organizers: A. Wineman, T. Pence

Session Chairs: T. Pence, K. Soldatos

- 9:15 USNCTAM2010-689: *On Being Swallowed by a Boa Constrictor*, A. Wineman
- 9:40 USNCTAM2010-1312: *The Magneto-Mechanical Coupling of Magneto-Sensitive Bodies with Finite Geometry*, L. Dorfmann, R. Bustamante, R. Ogden

Concurrent Sessions—Friday continued

- 10:05 USNCTAM2010-1157: *Surface Tension-Driven Shape-Recovery of Micro/Nanometer-Scale Surface Features in a Pt-Based Metallic Glass in the Super-cooled Liquid Region*, D. Henann, L. Anand
- 10:30 USNCTAM2010-646: *Modeling the Mechanics of Light Activated Shape Memory Polymers*, I. J. Rao, J. Sodhi
- 10:55 USNCTAM2010-1081: *On the Reflection of Quasi-Longitudinal Plane Waves at an Interface of Generalized Thermo-Piezoelectric Anisotropic Medium*, A. N. Abd-alla, A. Y., Al-Hossain

Dynamics

5-1 General

FA3 5-1-2 Special Topics in Nonlinear Dynamics

9:15 a.m. – 11:20 a.m., Senate 3

Organizer: J. Cusumano

Session Chairs: S. Miller, J. H. Kim

- 9:15 USNCTAM2010-756: *Dynamics of Spheres on Non-Planar Surface*, P. Cesarek, M. Saje, D. Zupan
- 9:40 USNCTAM2010-979: *Switching Chaos On/Off in an Inverted Pendulum by Bi-Chromic Forcing*, R. Chabreyrie, C. Chandre, N. Aubry
- 10:05 USNCTAM2010-1085: *Dynamically Orthogonal Field Equations for Continuous Stochastic Dynamical Systems*, T. Sapsis, P. Lermusiaux

- 10:30 USNCTAM2010-1191: *Prediction of External Reactions for Redundant System Dynamics*, J. H. Kim, K. Abdel-Malek, Y. Xiang, J. Yang, J. Arora
- 10:55 USNCTAM2010-764: *Chaos in a One-Dimensional Model for Cardiac Alternans*, D. Schaeffer

5-3 Recent Advances in Nonlinear Dynamics

FA104 5-3-2 Advances in Nonlinear Dynamics—II

9:15 a.m. – 11:20 a.m., Room 104

Organizers: T. Peacock, C. Rowley

Session Chairs: C. Rowley, W. Tang

- 9:15 USNCTAM2010-559: *Lagrangian Coherent Structures, Finite-Time Hyperbolicity and Lyapunov Exponents: A Unified View on Coherence in Moving Continua*, G. Haller
- 9:40 USNCTAM2010-406: *Lagrangian Coherent Structures in Finite Domains*, W. Tang, P. W. Chan, G. Haller
- 10:05 USNCTAM2010-1122: *Non-Affine Deformation in Complex 2D Flow*, N. Ouellette, D. Kelley
- 10:30 USNCTAM2010-1309: *Broadband Effects and Boundary Forcing in Low and Least Order Galerkin Models of Fluid Flows*, G. Tadmor, B. R. Noack, M. Schlegel, O. Lehmann, A. Manela
- 10:55 USNCTAM2010-1155: *Analysis of Dynamical Systems Using the Koopman Operator Formalism*, I. Mezic

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Abedi, R.	FA211	Antaal, B.S.	MA112	Bao, G.	TC208, RA208, RC2,
Abney, T.M.	RC4	Appathurai, S.	MA211		FA206
Abot, J.L.	MB107, TC108	Aragón, A.	FA105	Barbero, E.J.	RC218, FA218
Abu Al-Rub, R.K.	MA104, RB211,	Araujo, A.	MB208	Bardin, G.	MB107
	RC211	Aravas, N.	RC2	Barello, R.B.	MB107
Abudu, A.	TA219	Ardekani, A.	TC219, RC219	Baroud, C.N.	RC205
Acharya, A.	WA109, RC207	Ardeshir-Behrestaghi, A.	TA218,	Barral, J.	RC208
Adams, D.E.	TB108, WA108		FA109	Barsoum, M.	MB105
Adeeb, S.	MC1	Arias, I.	MC203	Bartel, T.	TB203
Admal, N.C.	WA112	Armero, F.	TB218	Bartsch, M.	TB104
Adumitroaie, A.	FA218	Arnold, S.	MA109	Bart-Smith, H.	TB2, RC2
Afkhami, S.	MC219, FA219	Arora, J.	FA3	Barua, A.	MB218
Aggarwal, G.	WA107	Arpin, K.	RC108	Basaran, O.	MA211
Aghababaei, R.	TA104, RB108	Arroyo, M.	MC207, MC105, TA211	Basciano, C.A.	FA112
Aghaei, A.	MB203, WA112, WA1	Arruda, E.	MC106, TC206, RB1	Bassani, J.L.	TB2, TC208, WA1
Agoras, M.	MC106	Arsenault, M.	RA1	Batra, R.C.	TB203
Agrawal, A.	RB208	Arslan, M.	WA206	Bau, H.	MA219, MB219, RA1,
Agrawal, R.	TA207, TB207	Arslan, M.A.	FA211		FA203
Agubra, A.	WA104	Aryae Panah, M.E.	RC105	Baumgart, J.	RC208
Ahmad, O.	TC205	Asaka, K.	MA207, MB207	Baxter, S.C.	TB208
Ai, Y.	MB219	Ascenzi, M.-G.	MB206	Bayly, P.	RC4, FA4
Aigner, M.	MC112	Aslanov, V.S.	MC3, TA3	Bazant, Z.	MB104, RB203
Aitken, Z.	MA105	Aslantas, K.	RA105	Bazilevs, Y.	MC112
Akhatov, I.	MC219, TA219	Ateshian, G. A.	FA1	Be'er, A.	RC104
Aktas, E.	WA108	Atitallah, H.B.	FA105	Bednarczyk, B.	MA109, MB109,
Alali, B.	TC106	Attinger, D.	MA219, MC211,		MC109
Alatkin, S.	WA203		MC219, TA219	Beek, P.J.	MA4
Alben, S.	RB219	Aubry, N.	MA219, TB219, RC219,	Beese, A.	MC218, MC1
Albrecht, A.	MC218		FA3	Begley, M.	RC2
Alexeenko, A.	FA203	Audoly, B.	TA112	Beiermann, B.	RC106
Al-Hossain, A.Y.	FA107	Aureli, M.	MA207, TB109	Belardo, M.	RB104
Ali, S.	MA108	Avila, C.	TB218	Belashi, A.	TA203
Alinejad, F.	FA105	Awadelkarim, O.O.	RB3	Bellis, C.	RA104
Alleman, C.	WA1	Aykutlug, E.	TA3	Bellizzi, S.	RA3
Allen, D.	MA109	Azeloglu, E.U.	RA1	Benson, D.	MC112
Almarza, A.	MA208	B Sathuvalli, U.	TB211	Benzerga, A.A.	MB109, TB2,
Altan, B.	MC206	Bagchi, A.	RC4		TC207
Amabili, M.	MA3	Bai, M.	RB208	Berger, J.	WA218
Amin, S.	RA205	Bailey, S.C.C.	MB205, MC205,	Bergers, L.I.J.C.	RB106
Amini, H.	TB219		TC211	Bergman, L.	MC3
Amirkhizi, A.V.	TA218, FA2	Bakis, C.	RC218	Bergou, M.	TA112
Ammar, H.H.	RA218	Balachandran, B.	MC3	Berhan, L.	TA203, WA109
Anahid, M.	RB211	Balasubramanian, G.	RC203, FA203	Bertoldi, K.	TA1

Best, J.	TC109	Butler, B.	RA208	Chen, Q.	TB218
Betti, R.	TC1	Bykhovskaia, M.	RB208	Chen, S.	TC211
Bhaganagar, K.	MB205	Byskov, E.	TA104	Chen, W.	MA218, TA109, FA4
Bhardwaj, R.	MA219, MC219, TA219	Cabrera, J.L.	TA4	Chen, Xi	MB208, MC206, TB105, TB206, WA104, WA105, RA108, FA106, FA206
Bhat, P.P.	MA211	Cai, S.	RC106	Chen, Xian.	FA1
Bhat, R.B.	RB104	Cai, W.	RA218	Chen, Xiao.	WA205
Bhattacharya, A.	FA218	Cai, Z.	MA1	Chen, Yi.	FA4
Bhattacharya, K.	MB106, MB2, RB2	Callari, C.	TB218	Chen, Yo.	MA203, MB109, RC112, RB206, RC207, FA207
Bian, S.	RC205	Calo, V.M.	TB112	Chen, Yue	MB106
Biju, B.	RC105	Camp, R.J.	RC206	Chen, Yul.	FA211
Birch, D.	MB205	Campbell, R.	TA208	Cheng, C.-M.	MB208
Bird, J.C.	MB211	Caner, F.C.	RB203	Cheng, J.-I.	MA218
Birman, V.	TB206	Cao, A.	MB107	Cheng, R.	MC1
Birn-Jeffery, A.	MB4	Cao, G.	FA4	Cheng, S.	WA2
Blachut, J.	TA1	Cardoso, L.	FA1	Cherkaev, A.	MB106
Bobaru, F.	MA218, MB109, MB107, RB112, RC112	Carcka, D.	RA2	Cherkaev, E.	MB106, MB206
Bobko, C.	TC218	Carroll, C.	MB211	Chester, S.	RB105, RC107
Bobrenkov, O.	TA3	Castley, D.	TC108	Chew, H.B.	RA2
Bohn, E.	MB2	Caswell, B.	TA211, FA112	Chew, Y.T.	FA219
Bolton, J.	RA104	Celik, A.	RA104	Chhabra, S.	RA205
Bond, I.	FA105	Cesarek, P.	FA3	Chiba, A.	RC206
Bonifasi-Lista, C.	MB206	Chabaat, J.F.M.	RC211	Chigullapalli, S.	FA203
Borboni, A.	FA109	Chabreyrie, R.	TB219, FA3	Childress, E.	FA112
Borg, J.	MB218	Chagelishvili, G.	MA2	Cho, H.	MB108
Borhan, A.	FA203, FA205	Chai, H.	RB106, FA2	Cho, Y.	MA108
Boros, E.	FA112	Chakraborty, I.	MC3	Chocron, S.	RA107
Bou-Zeid, E.	MC205	Chakraborty, P.	RB211	Choi, J.	FA205
Boyce, M.C.	MB206, WA206, WA218, WA218	Chambaud, G.	TA207	Choi, W.	TC108
Boykov, I.	WA203	Champagne, V.	RA107	Chou, H.-Y.	MB206
Boyle, J.	RC205	Chan, P.W.	FA104	Chou, S.-Y.	MB208
Brach, J.S.	MC4	Chandra, N.	RB4, FA4	Chow, C.	RC104
Brasseur, J.	MA2, MC205, WA211	Chandre, C.	TB219, FA3	Christ, K.V.	TA208
Brazell, M.	MA112	Chang, C.-H.	MA211	Christensen, J.	MB2
Bregman, D.J.J.	MA4	Chang, C.I.	FA207	Christensen, K.	MB205, TC109
Brenner, D.	MC211	Chang, D.	TB219	Chung, P.W.	WA207
Brenner, D.W.	MC203, TC1	Chang, H.	RC106	Chung, S.R.	MA206
Brianza, S.	FA206	Chang, H.	RC106	Ciocanel, C.	RA105
Bronnikova, T.	WA3	Charalambides, P.	TC2	Cisne, R.	RA205
Brownell, W.E.	FA208	Charlier, R.	TB203	Clayton, E.	RC4
Bruijn, S.M.	MA4	Chatterjee, S.	TA206	Cleary, P.W.	FA108
Bryant, M.	WA105	Chattopadhyay, A.	MC109, WA108	Clifton, R.J.	MC218
Bryl, D.	TB1	Chattopadhyay, S.	RB211	Climent, E.	TC219
Buckley, T.	TC4	Chauhan, K.	MC205	Cloots, R.J.H.	RB4
Buckner, G.D.	FA112	Chelidze, D.	RA3, RC3	Coelho, C.K.	WA108
Buechler, S.	WA218	Chen, A.	RA218, RB218, RC218, FA218	Coetzee, E.	WA4, RA4
Buehler, M.J.	MC208, RA1	Chen, C.	TB206	Cohen, T.	MA106
Bugarin, S.	MB109	Chen, C.-C.	MB208	Collier, C.	MC109
Buice, M.	RC104	Chen, D.	MC2	Collin, F.	TB203
Buschmann, M.H.	MA2, TB205	Chen, F.	TA112, FA218	Collins, L.R.	MA2, TA205
Bustamante, R.	FA107	Chen, Ja.	WA207	Collins, R.T.	MA211
Butcher, E.	TA3	Chen, Je.	RA112	Coman, C.	TA1
		Chen, J.S.	TA203		
		Chen, K.	RB109		
		Chen, P.-Y.	MA206		

Considine, J.	TC104	Davalos, J.F.	RA218, RB218,	Doraiswamy, S.	RA105
Conte, J.	RB219		RC218, FA218	Dorfmann, L.	WA206, RB206,
Cook-Chennault, K.	TC108, RB109	Davidovich, N.E.-T.	RB205		FA107
Cooper, R.M.	MC211	Davidson, L.	RC1	Dorgan, J.R.	WA109
Corona, E.	MB1	Davis, D.	RC106	Doroshin, A.V.	MC3
Cosaboon, D.	TC108	Dawood, M.	TC218	Douglas, I.E.	MC3
Costa, K.D.	RA1	Dayal, K.	TB105, WA112, RA105,	Douville, N.J.	WA205
Costanzo, F.	WA211, RC211		RC207	Doynov, B.	RB106
Cowell, J.	TC4	de Ruiten, R.	MB211	Drapaca, C.	RA211, FA108
Cowin, S.	FA1	De Santis, D.	FA109	Du, P.	TB109
Cox, B.	TC2, RA2	De Witte, V.	WA4	Du, Q.	TA112, RB112
Craven, B.	RB205	deBotton, G.	MC106, WA206,	Duan, H.	TA207
Crawley, B.R.	MB109		WA211	Duangpanya, M.	MB107
Crespi, V.	MC105, TA2	Dedé, L.	TB112	Dubey, D.	TA206
Crone, J.	WA207	Dehm, G.	TC207, RA207	Duchenne, S.	RA2
Cronin, C.	RC3	del Palomar, A.P.	MA208	Dumitrica, T.	MC207
Crouch, R.D.	MA109	DeLeone, C.	TC4	Dunn, M.	MC2, RB105
Crowdy, D.	MB211	Delhey, N.K.R.	RB106	Durban, D.	MA106, MC1
Cuadra, J.	RC219	Delph, T.	RB207	Durham, W.M.	TC219
Cummings, L.	MC219	deMeijer, V.	MC211	Dutta, D.	TA108
Cunningham, D.J.	RA107	Demirkoparan, H.	RB107, RC107	Dyedov, V.	TC112
Cusumano, J.	MC4, TB108, TB4,	den Toonder, J.M.J.	MC211	Ebner, R.	TC205
	TC4, RB3	Denda, M.	WA203	Ebrahimi, D.	TC218
Czabaj, M.	TC104	Denes, L.	RC218	Eckl, T.	MB2
D'orazio, D.	RB3	Deng, Q.	MA203, MB109, RA104	Eden, T.J.	WA107
Da Silva, A.	MC1	Deng, X.	MA211	Efstathiou, C.	RA105
Dadfarnia, M.	RB2	Deodatis, G.	TB106	Einstein, D.R.	TC112, RB1
Dafalias, Y.	RB108, RC108	Derogar, S.	WA106	Ek-khodary, K.	TC1
Dagher, M.	TA104	Deshpande, V.	MC104, TB2	Elad, D.	RB205, RC1
Dai, B.	TA109	DeSimone, A.	TA211	Elbanna, A.	MB1, TB3
Dai, H.-H.	MA1	Desroches, M.	RA4	Elbuken, C.	MC219
Dai, Q.	FA218	Dessi, D.	RB3	Elele, E.	MA211
Daigle, S.	TC4	Dewers, T.	TB109	Elkin, B.S.	RB4, RC206
Dal, H.	RB108	Dey, T.	TC112	Elliott, G.	TC109
Dalal, B.	RC219, FA219	Dezarn, W.A.	FA112	Elliott, R.	TB105, RC207
Daley, M.A.	MB4	Di Carlo, D.	MC211, TB219	Elsaid, A.	TC218
Dallas, V.	MC205	Diaz, J.	FA208	Elson, E.	RA208
Daly, S.	MA1	DiBerardino, L.	TC4	Engels, D.	FA108
Damazo, J.	MB218, RA109	Dick, A.J.	MB3	Errico, T.	MA206
Dames, C.	RA106	Dierkes, K.	RC208	Ervin, E.K.	TB3
Danas, K.	MA106, MC104	Dingreville, R.	TA207, TB203	Eskandari-Ghadi, M.	TA218, FA109
Daneshbod, Y.	MC219	Dingwell, J.	MA4, MC4, TA4,	Espinosa, H.D.	TA207, TA208,
Dankowicz, H.	MC4, WA4		TB4, RC3		TB206, TB207, TC206
Dannemann, K.A.	RA107	Dini, D.	MC104	Evans, T.H.	TA2
Dao, M.	RB206	Discher, D.	TB208, RA1	Faglia, R.	FA109
Daphalapurkar, N.	MA218	Djukic, L.P.	TA106	Fan, T.-H.	TC109, FA208
Darabi, M.	MB104, RB211	Doblare, M.	MA208	Fan, Y.	MA105
Dargaznay, R.	WA1	Dodds, R.H.	RC112	Fang, D.	TB207
Daripa, P.	RC219	Dökmeçi, M.C.	RC105	Fang, Xia.	MA219, MC219
Das, A.	WA109	Dolejs, S.	FA206	Fang, Xiu.	TB104, TC203
Das, K.	MB107, TB203	Doll, J.C.	RA218	Fang, Y.	RC107
Das, R.	FA108	Dongare, A.M.	MC203, TC1	Farhanieh, B.	TB211
Datta, A.	RA207	Donzis, D.A.	TC211	Farmer, B.	MA107
Daug, J.	TA219	Doorly, D.J.	RB205	Farris, T.N.	RB218

Farsad, M.	MB203	Garbow, J.	RC4	Grogan, J.	FA203
Fathi, A.	MC1	Garcia, E.	WA105	Grosh, K.	RC208
Fedosov, D.	TA211, FA112	Garikipati, K.	MA109, TC206, RB1	Gross, T.	MA208
Feeny, B.	MC4, RC3	Garty, G.	MC211	Grotberg, J.B.	WA205, RA205, RC205
Feigenbaum, H.	RA105, RB108, RC108	Gary, G.	MC218	Grover, P.	TB219
Feng, F.	MB3	Gates, D.H.	RC3	Grunschel, S.E.	MC218
Feng, L.	FA1	Gaver III, D.P.	WA205, RC205	Gu, D.	TC112
Feng, Y.	RC203, RC4	Gavini, V.	MB203	Gu, L.	RB4
Ferguson, V.	MA206	Geers, M.G.D.	RA218, RB106, RB211, RB218, RB4, FA2	Gu, W.	FA1
Fettiplace, R.	RC208	Geltmacher, A.	TA106	Guers, M.J.	MC108, TA108
Fichthorn, K.	FA203	Genin, G.	TB206, RA208, RC4	Guest, J.	RC105
Filоче, M.	RA205, FA205	Georgatzinos, S.	TB105	Guest, S.D.	RA105
Fischer, I.	RC219	Georgiou, I.	TB3, RB3	Guilleminot, J.	TB106
Fish, F.	RB219	German, R.M.	WA107	Gunzburger, M.	RB112
Fisher, I.	FA219	Geubelle, P.H.	MC218, FA105	Gupta, N.	TB109
Fleck, N.	MC104, TB2	Ghaderi, P.	MB3	Gurupatham, S.	FA219
Fleischer, M.	RC208	Ghadiali, S.	WA205, RB205	Guzina, B.	RA104
Flora, J.	MA108	Gharib, M.	RA104	Gyorffy, J.	TA4
Florens, M.	RA205, FA205	Ghosh, P.	RB105	Ha, Y.D.	MA218, MB109, RB112, RC112
Florin, E.L.	RC104	Ghosh, So.	WA1, RB211, FA211	Haber, R.	MA107, RA112, FA211
Flynn, B.P.	RC206	Ghosh, Su.	MC207	Hadjab, H.	RC211
Foley, H.	TB105	Gianola, D.	TC207	Hadji, L.	TB211
Foley, J.	RA203	Giurgiutiu, V.	TA108	Haj-Hariri, H.	RC2
Fonseca, P.C.	TC218	Glawdel, T.	MC219	Hallai, J.F.	MC1
Ford, C.C.	RC4	Goktepe, S.	RB1	Haller, G.	FA104
Forshey, B.	TB108	Golabchi, M.R.	RA105	Halpern, D.	RC205
Foss, J.F.	TC205	Goldberg, R.K.	MB109	Hamed, E.	FA1
Frank, E.	MC206	Goldenberg, Y.	WA206	Hamilton, R.F.	RA105
Frazier, B.	WA108	Goldman, Y.	RA1	Hamlet, C.	RB219
Freed, A.	RB1	Goldsmith, E.C.	TB208	Han, L.	MC206
Freund, J.	TA211	Golmon, S.	MC2	Hao, S.	RC218, FA207
Freund, L.B.	TA206	Gonella, S.	MA203	Hao, Z.	RC107
Friederichs, K.	MC4	Gonzales, T.	TC4	Haque, A.	MA107, TB105, FA2, FA207
Frolov, V.Y.	TA3	Göpfert, M.	RC208	Hari, Y.	MA112
Fu, H.C.	MC211	Gorbatikh, L.	WA218	Harlow, D.G.	FA211
Fu, Y.	MC105, RA207	Goriely, A.	TC206, WA206, RB1, RC104	Harris, M.T.	MA211
Fuhrer, Z.	TB108	Gouldstone, A.	WA107	Hasheminejad, M.	RC105
Gabriel, B.	RA107	Govaerts, W.	WA4	Hass, C.	TC4
Gad-el-Hak, M.	MA2, TB205	Govindaraju, N.	MB107	Hassan, A.	RB106
Galipeau, E.	WA2	Grady, D.	MB218	Hassan, T.	RA108, RC108
Galli, M.	MA206	Grady, M.	MC218	Hatami-Marbini, H.	RA206, RB206
Gallo, L.	MA208	Graham-Brady, L.	MA218	Hausrath, A.	WA206
Ganatos, P.	TA208	Grankin, M.	MC203	Hazel, A.	WA205
Ganesan, N.	RC105	Grasley, Z.	WA1	He, Q.-C.	MA203
Ganley, T.	MB207	Gray, R.	TA203	Healey, T.	TA1
Ganpule, S.	RB4	Greene, J.	MC206	Heaton, T.	MB1, TB3
Gao, Hua.	RA206	Greene, M.S.	MA203	Hedrick, T.	RA219
Gao, Hui.	MA108, TC207, TC208, RC211	Grigoriev, R.	TA219	Heil, M.	WA205, RC205
Gao, J.	TB4, TC4, RA3, RC3	Grigoriu, M.D.	TB106	Helenbrook, B.	MA112
Gao, T.	FA219	Grinspun, E.	TA112	Helfritch, D.	RA107
Gao, X.-L.	MA104, MB104, TA106	Grissom, M.	TB108	Heltai, L.	TA211, RA211
Gao, Y.	WA206, WA3	Grodzinsky, A.J.	MC206		

Henann, D.	RC211, FA107	Huebsch, W.	RC218	Jia, Z.	TC2
Henderson, M.E.	WA4	Hufner, D.R.	RC108	Jiang, H.	RC106, FA106
Henderson, S.E.	MA208	Hughes, E.	TB108	Jiang, P.	RB203
Henkelman, G.	RC112	Hughes, T.J.R.	MC112, TB112	Jiang, W.	WA3
Henry, F.	RA205	Hui, C.Y.	RB208	Jiao, P.	RB218
Herring, S.	MA208	Hultmark, M.	MB205, TC211	Jiao, R.	RA108
Herszberg, I.	TA106	Humphrey, J.D.	TC206	Jiao, T.	MC218
Hewitt, G.	MC205	Hung, D.L.S.	MB207	Jiao, X.	TC112
Hiche, C.	WA108	Hung, H.-H.	MC206	Jin, H.	TC104
Higgins, C.	MC205	Hur, S.C.	MC211	Jin, J.	MA107
Higuaita-Castro, N.	WA205	Huran, L.	TC3, RC109	Jin, Z.	FA108
Hills, D.A.	RC109	Hurmuzlu, Y.	RA104	Jo, W.	WA2
Hiriyur, B.	TB106	Hutchins, J.W.	MB109	John, J.	MC4, TB4, TC4
Hirth, J.	WA207	Hutchins, N.	MC205	Johnson, B.	TC109
Ho, J.	FA109	Huwald, H.	MC205	Johnson, D.	TB108
Hoagland, R.	WA207	Huyghe, J.	FA1	Johnson, D.D.	RA112
Hodges, D.	FA109	Idesman, A.	RA203, RA4	Johnson, T.P.M.	MB206
Hodgins, J.K.	MC4	Idiart, M.	MA1, MA106	Jones, C.	WA1
Hoefnagels, J.P.M.	RA218, RB106, RB218, FA2	Ilankovan, A.	RB4	Jones, J.J.	MA211
Hoey, J.	TA219	Imani, F.	RA218	Jones, R.E.	WA112
Hoffman, E.A.	FA205	Inaba, K.	MB218	Joseph, Da.	MA219, FA219
Hogan, T.E.	WA107	Ingber, D.E.	MC211	Joseph, De.	RB211
Holmes, J.	RA1	Ingraham, M.	TB1, TB109	Joshi, S.	MC106, TA104, RB108
Holzapfel, G.A.	TC206	Inubushi, T.	MA208	Joumaa, H.	WA106, RA104
Hong, S.	FA2	Irving, D.L.	MC203	Ju, S.P.	FA207
Hong, W.	RB107, RC106	Isaza, J.C.	MA2	Juay, T.C.	FA219
Hoover, C.G.	MB104, RB203	Isbuga, V.	MC203	Juha, M.	TB1
Horstemeyer, M.F.	TB203	Issen, K.	TB1, TB109	Jülicher, F.	RC208
Hosnijeh, A.A.	MC203	Itskov, M.	WA1	Jun, S.	MC207
Hossain, M.S.	RC219	Ivanenko, Y.	TA4	Jung, S.	TB211, WA219
Hosur, M.	WA104	Iwabuchi, Y.	MA208	Juster, A.L.	TB206, TC206
Hou, S.	FA206	Iwasa, K.H.	FA208	Jüttler, B.	MC112
Houle, N.	TB2	Iyer, M.	MB203	Kakavas, P.A.	TB105, RB107
Hover, F.	RB219	Izawa, T.	MA208	Kaliakin, V.	RB203
Hrapko, M.	RB4	Jacobs, L.	MC108	Kalidindi, S.	TA106
Hsiao-Wecksler, E.T.	MC4, TC4	Jafari, A.	FA105	Kaliske, M.	MB2, MC2, WA2, RB108
Hsu, M.-C.	MC112	Jagota, A.	RB208	Kamrin, K.	TC106
Hu, H.	MB219, FA219	Jaipurjar, A.	RC218	Kang, M.K.	MB1
Hu, J.	TC4, RA3, RC3	Jakimaviciute, V.	MA206	Kang, W.H.	RC4
Hu, Wei.	TA203, RB112	James, R.D.	WA112	Kanso, E.	RB219
Hu, Wen.	MB109	Jana, S.	WA219	Kapl, M.	MC112
Hu, Y.	TC218, RB2	Jang, W.-Y.	TB1	Kaplan, D.L.	RB206
Hu, Z.	RC218	Janjua, M.	MA219	Kappiyoor, R.	RC203, FA203
Huang, C.	TC2, RB208	Jasiuk, I.	MB206, MC206, TC106, FA1	Karagiozis, K.	MA3
Huang, C.-Y.	FA1, FA105	Javani Joni, H.R.	RB211	Karimpour, H.	WA218
Huang, G.	TA207, TA218	Jayanty, S.	WA109	Karniadakis, G.	TA211, FA112
Huang, H.-H.	MC104	Jeelani, S.	WA104	Karntthaler, H.-P.	RA207
Huang, J.	MB105	Jeka, J.J.	TA4	Karpov, E.	MC203
Huang, R.	MA105, MB1, MC207	Jennings, H.M.	TC218	Karzar-Jeddi, M.	TC109, FA208
Huang, S.	TA2	Jensen, H.M.	WA104	Katsareas, D.	TB105
Huang, W.L.	FA207	Jensen, O.	RC205	Kauffman, J.L.	RA109
Huang, X.	MC105	Jeong, Y.	RC218	Kaushik, A.	MC106
Huang, Z.	TA2	Jhang, K.Y.	TC108	Kaushik, G.	RA1

Kawai, N.	MA208	Koratkar, N.	RB108	Lee, D.-W.	TC207
Kayabasi, O.	FA211	Koslowski, M.	TC207	Lee, H.	TC106
Keane, J.M.	RA107	Kotov, N.	MC106	Lee, H.K.	TB105
Keith, T.	TC109	Koudela, K.L.	TB104	Lee, J.	MA107, MA108, MC109, WA207, RA104, RA112
Kelley, D.	FA104	Kozola, B.	FA105	Lee, J.S.	FA4
Kemkemer, R.	RB1	Kraczek, B.	RA112	Lee, L.C.	MC104
Kemp, T.	TB2	Kraft, O.	MC2	Lee, S.	MC109
Kennedy, A.S.	FA112	Kraige, L.G.	RA104	Lee, S.-L.	RA208
Kenney, P.	TC109	Kramer, S.	RC106	Lee, T.H.	TC108
Kephart, G.	TC4	Krauskopf, B.	WA4, RA4	Lee, W.M.	TC1
Keralavarma, S.	TB2, TC207	Kreplak, L.	MC208	Lee, Y.H.	MC206, FA1
Kesari, H.	RA218	Krische, M.J.	RB106	Legant, W.	RA208
Keshavarzi, B.	FA205	Krishna, S.	RC108	Lehmann, O.	FA104
Keyak, J.H.	MB206	Kuhl, E.	RB1	Lehoucq, R.B.	RB112
Khabbazian, M.	RB203	Kuhlenschmidt, M.	WA208	Leighton, R.	MB205
Khaderi, S.N.	MC211, TA206	Kuhlenschmidt, T.	WA208	Leishear, R.	TC3
Khan, K.A.	MB107	Kulkarni, M.	TA106	Leisk, G.G.	RB206
Khatam, H.	RB108	Kulkarni, Y.	RA207	Leist, T.	WA2
Khoei, A.R.	MB203, WA1	Kumar, A.	TA1	Leng, Y.	TB207
Khujadze, G.	MA2, TA205	Kumar, P.	TB219	Leok, M.	RA4
Khusid, B.	MA211	Kumar, S.	FA2	Leong, F.Y.	RC203
Kiemel, T.	TA4	Kumar, V.	MB3	Lepore, J.	TC211
Kiener, D.	TC207	Kunz, R.	FA205	Lermusiaux, P.	FA3
Kim, C.S.	TC108	Kuo, H.-Y.	RB109	Lesieutre, G.	RA109
Kim, J.	TC112	Kuroda, S.	MA208	Leta, J.	MC105
Kim, J.H.	FA3	Kuznetsov, Y.A.	WA4	Leung, A.	RC4
Kim, J.-S.	TB108	Kyriakides, S.	MC1, TB1, RA108	Levasseur, S.	TB203
Kim, J.-Y.	MC108	Lach, J.	TA4	Lévesque, M.	MB107
Kim, K.	MA1	Lacquaniti, F.	TA4	Levine, A.	RB208
Kim, K.J.	MB207	Lacy Jr, T.E.	MB109	Levitas, V.I.	MA1, FA106
Kim, K.-S.	RA2, FA2	Lade, P.V.	WA218	Levy, A.	FA112
Kim, S.-M.	RC211	Laeven, P.	TA4	Lew, A.J.	TA112, RA218
Kimberley, J.	MB218	Lagoudas, D.	MB107, TB207	Lewis, A.	TA106
Kim-Lee, H.-J.	RB107	LaMattina, B.	MC203, TC1	Li, G.	MA105, RA218, RB218
King, M.	FA4	Lambert, A.R.	FA205	Li, H.	RA206
Kingsbury, C.	RC106	Landis, C.M.	MB106, RA2	Li, J.	TC208, WA106, RB208
Kinzer, J.	WA108	Lang, E.M.	RC218	Li, J.-S.	TB206
Kirca, M.	MA203, MB105, MC105	Lanir, Y.	RC1	Li, Q.	TB108
Kleinstreuer, C.	RC203, FA112	Lapusta, N.	MB1	Li, R.	WA112
Klewicki, J.C.	TB205, TC205	Lapusta, Y.	RC106	Li, S.	MB104, TC208, RB207
Klokov, A.	TA3	Latourte, F.	TC206	Li, T.	MA105, MC207, MC208, TC2, RA106, RB109, RB207
Kloog, Y.	RB205	Lau, C.	FA208	Li, W.	MA108
Klug, W.	RB208	Laverty, R.	RA107	Li, Xia	RA203
Kluge, J.A.	RB206	Lawson, M.	RB205	Li, Xian.	RA112
Knapp, J.	WA207	Lazar, L.	MA206	Li, Xiao.	TC207
Knothe, U.	FA206	Le, H.	MC211	Li, Y.	RC211
Knowles, J.	RA4	Le, J.	MB104	Liang, W.	TA206
Kodambaka, S.	MA105	Leal, G.	MB211	Liao, M.L.	FA207
Koduru, J.P.	TA108	Lebensohn, R.	MA106, TA106	Liechti, K.	MC206, MC218, RB106, FA106
Koester, D.J.	TB108	Leblond, J.-B.	MA106	Lim, J.Y.	FA4
Kohut, A.	MC219	Lecce, L.	MC108	Limam, A.	MC1
Kondo, D.	TB203	LeDuc, P.R.	MB208, RA206		
Kong, F.	TB208	Lee, B.B.	MC206		
Kontsos, A.	MB106, TB106	Lee, C.-Y.	MC106		

Lin, C.-L.	FA205	Luo, T.	MB208	McKittrick, J.	MA206
Lin, G.	RC218	Lutfurakhmanov, A.	MC219, TA219	McManus, N.	RA107
Lin, H.	MB219	Lykotrafitis, G.	RA206, RA208	McMeeking, R.	MB2, MC2, TB2
Lin, H.-T.	WA206	Lynch, C.	WA2	McWilliams, B.	TC104
Lin, I.-K.	TB109, FA108	M Zikry, M.	TC1	Means, K.	RC218
Lin, J.	MA207	Ma, H.	MA104	Mease, K.D.	TA3
Lin, W.	MA207	Ma, J.	RB1	Meaud, J.	RC208
Lin, Y.	MC208, TA206	Maciaszek, J.L.	RA208	Meda, G.	WA109
Lin, Y.-W.	MB208	Mada, M.R.	TC108	Meehan, C.	RB203
Lin, Z.	RB203	Maddahian, R.	TB211	Meguid, S.A.	TA218
Lindner, B.	RC208	Madou, K.	MA106	Mei, F.	RB109
Lipton, R.	MB106, TC106	Mahdinia, M.	TB211	Meijer, K.	TA4
Lipton, S.	TB112	Mahmoud, A.M.	RA218	Meijer, O.G.	MA4
Lissenden, C.	MB108, MC108, RC108	Mahmud, Z.	TA219	Mejia-Alvarez, R.	MB205, TC109
Liu, D.	WA104	Maier, H.J.	RA105	Meneveau, C.	MC205
Liu, J.	MC4, RC218	Majdoub, M.	MC2	Meng, W.	RB109
Liu, K.	MC109	Majumdar, A.	RA205	Menon, T.	MB112
Liu, L.	TA104, TB105, WA104, WA105, RC207, FA106	Mal, A.	MB108, MC108	Mesarovic, S.	MA112, RA203
Liu, Me.	TA106	Maleki, M.	RA109	Metzger, M.	TB205
Liu, Mi.	RA3	Manela, A.	FA104	Mezic, I.	FA104
Liu, W.K.	MA203	Manneville, P.	RC205	Michaux, B.	RB207
Liu, X.	RA203	Manohar, S.	RB208	Michelitsch, T.M.	WA106
Liu, Y.	TB206	Manoharan, M.	MA107, TB105	Migorski, S.	RC109
Liu, Z.	TC1	Manzari, M.	TB218, WA203	Mihai, C.	WA205
Liu, Z.-J.	MA208	Maranganti, R.	MC2	Mikata, Y.	WA109
Lockhart, T.	TA4	Marcombe, R.	RC106	Mikoshiha, K.	WA105
Loeffel, K.	TC1	Marcos, M.	MC211	Miller, G.	TC104
Logan, D.	TA4	Marcu, F.M.	MA206	Miller, J.K.	MB3
Loh, O.Y.	TA208, TC206	Mariani, R.	RB3	Miller, L.	RB219
Loken, G.	MC219	Martin, B.	TA109	Miller, S.	MA107, RA112
Lomov, S.V.	WA218	Martin, P.	RC208	Mills, K.L.	RB1
Long, B.	TB4	Martinelli, D.	RC218	Milton, J.	TA4
Long, K.	RB105	Martinez, J.	RC218	Ming, P.	RA112
Long, R.	RB208	Martinez, M.	MB207	Mirzapour, A.	FA109
Longtin, J.	TA219	Marusic, I.	MC205	Misra, A.	WA207
Lopez, B.	MA108	Marzari, N.	RA2	Missel, A.	RB208
Lopez, E.	MB112	Masad, E.A.	RB211	Mitrushchenkov, A.	TA207
Lopez, M.M.	RC218	Matic, P.	RC4	Mittal, R.	RA219
Lopez-Pamies, O.	MA1, MA106, MC106	Matous, K.	TC106	Miura, M.	TB104
Lorioux, F.	MC1	Matthews, P.J.	TB104	Mockensturm, E.	MC105
Lou, J.	TC109	Matveev, K.	MB211, TB211	Modarres-Sadeghi, Y.	RB219
Louge, M.	MB211	Maugin, G.A.	WA106	Moehlis, J.	RC104
Loverich, J.	TB108	Maute, K.	MC2	Moenig, R.	MC2
Lowenberg, M.	WA4, RA4	Mayeur, J.	MA104	Moesen, M.	WA218
Lu, H.	TB109	Mazellier, N.	MA2	Mohr, D.	MC1, MC218
Lu, J.	MC112	McAndrew, P.	TA4	Molinari, J.-F.	MA218
Lu, L.	TC2	McArthur, J.	RA219	Mollenhauer, D.	TA106
Lu, Q.	MC207	McBride, S.	FA206	Monaco, E.	MC108
Lua, J.	TC203	McDowell, D.	MA104, TA2	Moncada, A.	WA108
Lubineau, G.	RB109	McGough, P.T.	MA211	Monks, J.	MA108
Luk, V.	TA109	McGraw, B.	RC218	Montoya, A.	TC1
		McIlhany, K.	MA219	Monty, J.	MC205
		McKeon, B.	TB205	Moody, N.R.	MB1
		McKinley, G.	RC219	Moon, F.	MA3

Moore, J.	RC106	Ng, K.	FA218	Palmer, J.	TC109
Moore, S.	WA203	Nguyen, C.	FA112	Pan, E.	TA203, WA203
Moored, K.	TB2	Nguyen, H.	TB4	Pan, H.	TB2
Morais, A.	RA205	Nguyen, T.	TA208	Pan, W.	FA112
Morrill-Winter, C.	TB205	Nicolleau, F.C.G.A.	WA106	Parameswaran, H.	MB208
Morris, Sc.	TC205	Nie, X.	MA218	Park, H.	RA106, RB207
Morris, St.	MC104	Nielsen, C.	FA2	Park, I.	MA108, TC108
Morrison, B.	RB4, RC206, RC4	Niemczura, J.	MA218	Park, J.H.	MB4
Morrison, J.	MB205	Niezgoda, S.	TA106	Park, K.	MC4, TC4
Moser, R.D.	TB205	Nilsen, N.	FA208	Parks, D.	MC108, RA2
Moss, W.	FA4	Noack, B.R.	FA104	Parks, M.	RB112
Mott, D.	MA219	Novak, P.	RB2	Parlange, M.	MC205
Mott, P.	WA107, WA109	Nowakowski, A.F.	WA106	Parteli, E.	RA205
Moulton, D.E.	RC104	Noyan, I.C.	TC1	Paskaramoorthy, R.	MB109
Mu, J.	MC108	Nudurupati, S.	MA219	Paslay, P.R.	MA3, TB211
Mueller, N.	TB104	Nudurupati, S.C.	FA219	Pasquali, M.	MA211
Muftu, S.	MB112, MB206, WA107, RB218	Nugent, K.E.	WA107	Passmore, L.	RB3
Mukdadi, O.M.	RA218	Nurse, A.	RB208	Paterson, E.	RB205
Muliana, A.H.	MB107, FA105	Oberlack, M.	MA2, TA205	Patil, M.	TB104
Mullin, T.	TA1	Obrecht, H.	TB1	Paynter, R.J.H.	RC109
Munday, L.B.	WA207	Ochoa, O.	TA106	Pecora, M.	RB104
Murad, S.	FA203	Ogden, R.	FA107	Pedley, T.J.	TC219
Murphy, C.J.	TB208	Oh, S.T.	MA3	Peerlings, R.	RB211
Murthy, N.K.	RB218, FA2	Ohira, T.	TA4	Pei, L.	WA3
Mustoe, G.	WA218	Okamoto, R.J.	RC4	Peinke, J.	RB3
Mydlarski, L.	TC211	Olberding, J.E.	TC206	Pence, T.	RB107, RC107
Myers, N.S.	WA107	Olesiak, S.	MA206	Peng, B.	TA207
Mysore, K.	TA112, TB112	Olgac, N.	TC109, FA208	Perez, I.	WA108
Na, S.R.	RB106	Oliver, T.A.	TB205	Pervin, F.	FA4
Nabeth, J.	FA203	Onck, P.R.	MC211, TA206	Peters, G.W.M.	RB4
Nadim, A.	MC219	Onipede Jr, O.	TA203	Peterson, S.	MA207, TB219
Nadrowski, B.	RC208	Oran, E.	MA219	Peterson, S.D.	MA207
Naghipour, P.	TB104	Orlandi, P.	TA205, TC211	Pham, G.	MB2
Nair, S.	MB112	Ortiz, C.	MC206, RB206	Phan, N.	WA108
Najafi, N.	RC105	Osada, T.	TC3	Phillips, F.	TB207
Nakamura, T.	MA106	Oskay, C.	MA109, RB211	Picu, C.	WA106, WA112, RA206, RB108
Nakshatrala, K.B.	MB112	Ostoja-Starzewski, M.	WA106, RA109, FA4	Pierce, R.E.	FA4
Nam, J.-H.	RC208	Otani, N.F.	WA3	Pilgerstorfer, E.	MC112
Namani, R.	FA4	Ouellette, N.	FA104	Pindera, M.-J.	RB108
Narasimhan, K.	MB109	Ounaies, Z.	FA105	Pineda, E.	MC109
Narayanan, H.	RB1	Ovaert, T.	FA206	Pinsky, P.	RB206
Narayanan, V.R.T.	MB219	Oyen, M.	MA206	Pirozzoli, S.	TA205
Narita, F.	TB104	Paci, J.T.	TB207	Pitt, J.	TB108, RC211
Nathan, A.	RA208	Padubidri, G.	TC207	Plesek, J.	RC108
Nayyeri, S.	RA109	Paetsch, C.	WA206	Pless, R.	RC4
Neggars, J.	RA218	Paez Chavez, J.	WA4	Plummer, J.D.	MB219
Negreanu, I.	MC218	Pai, C.-L.	WA218	Podsiadlo, P.	MC106
Neishtadt, A.	RC104	Paidoussis, M.	MA3	Pogue III, W.	MB2
Nekouzadeh, A.	RA208	Paietta, R.	MA206	Ponte Castaneda, P.	MA1, MA106, MB106, MC106, WA2, FA219
Nelatury, S.	TA203	Palaniappan, D.	TB211	Pop, P.A.	MA206, TC3
Nemat-Nasser, S.	MA207, TA218, FA2	Paletta, N.	RB104	Popovics, J.	MB108
Nessler, J.	TC4	Palla, M.	RC211	Porfiri, M.	MA207, TB109
		Palle, P.	MA211		

Porowski, R.	MB218, RA109	Rankin, J.	RA4	Roy, Si.	WA208
Postlethwait, E.M.	FA205	Rao, I.J.	FA107	Royer, R.	TA108
Poulain, X.	MB109	Rao, V.P.	RB105	Ruberti, J.	RC206
Pour, B.H.	TC203	Rasheed, H.A.	RA109	Rudd, R.E.	RB207, RC112
Powers, T.	MC211, WA219	Ravi-Chandar, K.	MA218, MC218,	Rudraraju, S.S.	MA109
Prabhakar, P.	MA109		FA106	Rudykh, S.	MC106
Prakash, A.	TC203	Ray, I.	RA218, FA218	Rummel, J.	MB4
Prasad, A.	RA205	Rayasam, M.	TB112	Rutledge, B.	MC4
Prevost, J.	TB203	Redfern, M.	MC4	Rutledge, G.C.	WA218
Price, P.	MA206	Reedy, E.D.	MB1, TC106	Ryvkin, M.	TC2
Prince, C.	MA207	Regueiro, R.	MC203, TC218	Saboori, P.	RB4
Priyadarshana, P.	TB205	Reichard, K.	TB108	Saccomandi, G.	RB206
Prucz, J.C.	TA2	Reid, R.G.	MB109	Sacks, M.	RB1, RC1
Pruitt, B.L.	RA218	Reid-Bush, T.	MC4	Sadegh, A.	RB4
Pryse, K.	RA208	Reina, S.	RC109	Saeedi, K.	RB104
Puder, M.	MC211	Reinicke, U.	TB1	Saeidi, N.	RC206
Pugal, D.	MB207	Reis, P.	TA1	Sahay, R.	FA219
Puglisi, G.	RB206	Ren, C.	MC219	Saif, T.	WA208, RA207, RB106,
Puri, I.K.	RC203, FA203	Renardy, M.	MC219, FA219		RC206
Purohit, P.	MC208, TA206, RA1,	Renardy, Y.	MC219, FA219	Sailer, R.	MC219
	RA206, RA208	Rencis, J.J.	MB105	Saje, M.	TC203, FA3
Puthillath, P.	MC108	Renjewski, D.	MA4	Salazar, J.P.L.C.	TA205
Qi, J.	WA208, RB105	Rentenberger, C.	RA207	Salvetti, M.	RA2
Qian, D.	TA203, TB105	Rhee, W.J.	RA208	Sampaio, R.	RA3
Qian, J.	TB208, TC208	Rhoads, J.F.	MB3	Sansoz, F.	TB207
Qian, S.	MB219	Ricci, F.	MC108	Santacreu, P.-O.	MC218
Qian, Xiaoh.	RA106	Rice, B.M.	WA207	Santhanakrishnan, A.	RB219
Qian, Xiaop.	TB112	Rice, J.R.	RA2	Sapoval, B.	RA205, FA205
Qiao, P.	FA218	Ricks, T.M.	MB109	Sapsis, T.	MC3, FA3
Qidwai, M.A.S.	MB2, TA106	Rim, J.	TB206	Sargsyan, S.	RC107
Qin, M.	MB219	Ritchie, R.O.	RB2, RC2	Sastry, S.P.	TC112
Qin, Q.	TB207, RB106	Ritter, A.	MA206	Sato, M.	MC105
Qin, Z.	MC208	Robertson, C.G.	WA107	Savelberg, H.	TA4
Qiu, T.	TA109	Robinson, D.N.	MB208	Schaefer, P.	RA208
Qu, J.	MB107, MC108, TA207,	Rödel, J.	WA2	Schaeffer, D.	FA3
	FA106	Rodin, G.	MB203, RC109, RC112	Schaffer, W.	WA3
Racherla, V.	MA1	Roland, C.M.	WA107, WA109	Schiff, S.	RC3
Radhakrishnan, H.	RA203	Rollett, A.D.	TA106	Schilder, F.	WA4
Rafferty, K.	MA208	Roos, P.	MA4	Schlegel, M.	FA104
Raghavan, V.	MB107	Roos, R.	FA1	Schmidt, M.	RA203
Rahimi, M.	MC105	Rosario, K.	WA104	Schneider, G.	RC2
Rahman, Sh.	MA112	Rosato, A.D.	RC219	Schneider, J.	TB104
Rahman, Sy.	RA108	Rose, J.L.	MA108, MC108, TA108	Schneiderman, A.	MC1
Raj, R.	TA206	Ross, M.	TC205	Schreder, K.	TC106
Rajagopalan, J.	RA207, RB106	Ross, S.	MA3, MA4, TB219	Schroter, R.C.	RB205
Rajagopalan, R.	TB105	Rossgatterer, M.	MC112	Schukin, I.T.	TA3
Rajendran, A.M.	MC203, TC1	Rosteck, A.M.	TA205	Schulz, D.	MC219, TA219
Ramachandran, A.	MB211	Roux, C.	TC2	Schulz, M.J.	TC108
Ramachandran, S.	MC205	Rowlands, R.E.	TC104	Schumacher, J.	TC211
Ramakrishnan, S.	MC3	Roy, Aj.	MA107	Schwarzmaier, U.	MC112
Ramesh, K.T.	MA218, MB218,	Roy, An.	MB211	Searfass, C.	MC108
	MC106, TC104, RB4	Roy, Ar.	TB108, RB3	Seaver, M.	WA108
Rampurawala, Z.	TC4	Roy, G.	RC109	Sedlmayr, A.	MC2
Rangarajan, R.	TA112	Roy, Sa.	MB109	Segala, D.	RC3

Segall, A.E.	WA107, FA108	Siechen, S.	RC206	Srivatsavaya, M.	TC108
Sehitoglu, H.	RA105	Silberstein, M.N.	WA218	Stapleton, S.	MA109
Seipel, J.	MB4	Silling, S.A.	RB112	Steinbrick, M.	TC4
Seleson, P.	RB112	Simkins Jr, D.C.	TB1	Sterling, J.	MC219
Selvarasu, P.	MC218	Simmonds, K.	RC4	Sternberg, P.	RC3
Senatore, C.	MA4	Simmons, J.M.	TB203	Stocker, R.	MC211, TC219
Senden, R.	TA4	Sinclair, G.	WA109	Stone, H.	MB211, MC211
Sendova, T.	RC207	Singh, P.	MA219, TB219, RC219, FA219	Stone, J.W.	TB208
Seracino, R.	TC218			Stradley, D.S.	TC104
Sethi, G.	WA107	Singh, R.	RC207	Stremler, M.	TB219
Sett, K.	TB109	Sivaloganathan, S.	RA211	Stresing, R.	RB3
Settles, G.	RB205	Smallwood, B.S.	WA109	Su, C.	WA3
Seyfarth, A.	MA4, MB4	Smid, I.	WA107, RA107	Su, T.	MC208
Shah, A.	TA208	Smilauer, V.	RB203	Subbarayan, G.	TA112, TB112
Shah, S.	MC205	Smirnova, R.S.	TA3	Subramanian, G.	RA206
Shahinpoor, M.	MA207	Smith, B.J.	WA205	Subway, T.	TB211
Shahraz, A.	FA203	Smits, A.	MB205, MC205, TC211	Suki, B.	MB208, RA205
Shankar, K.	RC105	Smolka, L.	MA211	Sullivan, A.	WA3
Shanov, V.N.	TC108	Soare, M.	WA106	Sun, C.T.	MC104, WA105
Shaparenko, B.	MB219	Sobotka, J.	RC112	Sun, S.	TB208, FA208
Shariyat, M.	FA105	Socrate, S.	MB206	Sun, W.	TA218, TC218
Sharma, A.	TB205	Sodhi, J.	FA107	Sundaram, N.	RB218
Sharma, P.	MC2, RB2	Sofronis, P.	RB2	Sundararaghavan, V.	MC109
Sharma, S.	RA4	Soghrati, S.	FA105	Suo, Z.	TC218, WA2, RB2, RC106
Sharma, V.	RC219	Sohn, H.	TA108	Suresh, S.	RB206
Shean, T.	MA206	Soize, C.	TB106	Swenson, O.	TA219
Sheer, F.	RB205	Solanki, K.N.	TB203	Swinney, H.L.	RC104
Shen, Y.	MA211	Solares, S.D.	WA207	Szefi, J.	TB108
Shen, Y.-L.	WA203	Soldatos, K.	TA104, RB107	Sznitman, J.	FA205
Shenoy, V.	MC208	Somasundaran, P.	MA219, MC219	Taber, L.A.	RC1
Shepherd, J.E.	MB218, RA109	Somerday, B.	RB2	Tabor, M.	TC206
Shestopalov, N.	RC112	Song, B.	TA109	Tadmor, E.B.	WA112, RC207
Shi, Jian.	TC203	Song, F.	TA207	Tadmor, G.	FA104
Shi, Jiay.	RB218	Song, J.	MB1	Tai, C.	RC205
Shi, L.	RA106	Song, M.J.	RC106	Takagi, K.	MA207
Shi, Q.	WA1	Song, Yi	MB107, TC108	Takayama, S.	WA205
Shi, X.	RA206	Song, Yu	RC205	Takeda, T.	TB104
Shi, Y.	TC211	Sorkin, V.	MA105	Talaty, M.	MA4
Shiiba, K.	MA207	Sosa, E.M.	RC218	Tallapragada, P.	MA3
Shilvan, E.P.	TA3	Sosnoff, J.J.	TC4	Tan, X.	MB207, RC107
Shima, H.	MC105	Sottos, N.R.	MC218, TC104, RC106	Tanaka, E.	MA208
Shin, S.	TB4	Soualah, A.	RA205	Tanaka, M.	MA4, TB4
Shindo, Y.	TB104	Souza, F.	MA109	Tancredi, S.	MC108
Shirzad, F.	TA218	Spector, A.A.	FA208	Tang, W.	FA104
Shishkina, O.	WA218	Spedding, G.	RA219	Tang, X.	WA208
Shklyae, O.	MC105	Spray, D.C.	TA208	Tang, Y.	MB208
Shmuel, G.	WA211	Springman, R.M.	TC208	Tanimoto, K.	MA208
Shontz, S.M.	TC112	Spyrou, L.	RC2	Tanveer, M.	TB3, RA203
Shoukry, S.N.	TA2	Sreenivasan, K.R.	TC211	Taponier, V.	MC1
Shrivastava, S.	TB1	Srinivasa, A.	RA105, RB105	Tate, M.K.	MB206, RC106, FA206
Shukla, A.	TC4	Srinivasan, S.	MB112	Tawhai, M.H.	FA205
Shuman, H.	RA1	Srinivasan, S.M.	RB105	Taylor, D.J.	RB205
Siboni, M.H.	MB106	Srivastava, A.	WA1	Taylor, P.A.	RC4
Siddiqui, M.	TB4	Srivastava, V.	RB105	Tayyeb, W.	WA1

Terdalkar, S.	MB105	Valentín III, A.	TC206	Wang, X.D.	TA218
Theofanous, T.G.	MA211	van den Bogert, A.	MA4	Wang, Ya.	TA207
Thomas, J.	MB2	Van Dieen, J.H.	MA4	Wang, Ye.	MC219
Thomopoulos, S.	TB206	van Dommelen, J.	RB218, RB4, FA2	Wang, Z.J.	RA219
Thompson, G.	RC218	van Duin, A.	RC206	Wardetzky, M.	TA112
Thompson, J.	MA219	Van Houten, E.	FA4	Warren, W.E.	TA104
Thouless, M.D.	TC206	Van Velsor, J.K.	MA108	Waters, S.	RC205
Thurber, A.	RB206	Vandiver, R.	RB1	Watts, M.	RB219
Tian, L.	TA112	Vanka, P.	MB206	Webber, K.	WA2
Tianfu, G.	RC211	Vantsevich, V.	RB104	Weerasooriya, P.T.	MA218
Tilley, B.S.	MB219	Varner, V.D.	RC1	Wei, T.	MC205
Timmermans, P.H.M.	RA218	Varshney, V.	MA107	Wei, Y.	TC207
Tittmann, B.R.	MC108, TA108	Vasconcelos, T.	RA205	Weinbaum, S.	TA208
To, A.	MA203, MB105, MC105,	Vasiliev, A.	RC104	Weissmuller, J.	TA207
	RA207	Vassilicos, J.C.	MA2, MC205, RB3	Wenner, S.	TB108
Tomar, V.	TA206	Vaughan, B.	RC205	Whitcomb, J.	MB107
Tong, S.	FA206	Ventsel, E.S.	WA203	White, K.	TC4
Tonge, A.	MB218	Verner, S.N.	RB1	White, S.R.	TC104, RC106, FA105
Toomey, R.	TB1	Vernerey, F.	MB104, MB203	Whittaker, R.	RC205
Toroian, D.	MA206	Vernescu, B.	MB219	Whitzer, M.	TC108
Tran, P.	MC218	Verpoest, I.	WA218	Wiggins, S.	MA219
Trask, R.	FA105	Vlassak, J.	TC218	Wilber, J.P.	MC105
Travascio, F.	FA1	Voelker, B.	WA2	Wilbert, A.	TB1
Trexler, M.	RA107	Voggenreiter, H.	TB104	Wilken, J.M.	TA4
Triantafyllou, M.	RB219	Vogler, T.	MB218	Wilkening, J.	MC104
Trickey, S.T.	WA108	Voigt, A.	RC208	Wilkie, K.P.	RA211
Trimmer, B.	WA206	Voronov, A.	MC219	Willems, P.	TA4
Trolier-McKinstry, S.	RA106	Voth, G.	MA219	Willey, C.	TC4
Trutoiu, L.C.	MC4	Vouga, E.	TA112	William, G.	TA2
Tsai, S.	MC211	Waas, A.	MA109, MC106, MC109,	Williams, D.K.	MA112
Tsai, V.C.	RA2		WA206	Williams, O.	MC205
Tsiglifis, K.	MB211	Waisman, H.	TB106, TC1, WA112,	Willshaw, S.	TA1
Tsopelas, P.	RC108		RA203	Wilson, C.W.	TB208
Tsuda, A.	RA205	Waldauer, A.	RA105	Wineman, A.	WA206, RB107, FA107
Tucker, M.B.	TC2, RA106, RB109	Walker, E.A.	MA107	Witelski, T.P.	MA211
Tung, W.	RA3, RC3	Walker, G.	MA107	Wognum, S.	RC1
Tung, Y.-C.	WA205	Walkowiak, M.	TB1	Wolf, M.	RB205
Turnbull, B.	MB211	Walsh, W.	RC207	Wong, K.L.	WA3
Turner, D.	TA106	Walton, J.	WA211	Woods, W.	WA206
Turner, K.T.	TA208, TC104, RB107	Wan, K.	MA105, TA208, RA218,	Wright, R.	RB4
Turner, M.	TB108		RB218	Wu, C.Q.	MB4
Twigg, J.N.	WA107	Wang, H.	TB207	Wu, D.	TA208
Ucak, A.	RC108	Wang, Jian	WA207	Wu, H.	FA203
Ukadgaonker, V.G.	FA109	Wang, Jianc.	TC211	Wu, X.	MB205, TC205
Ulker, M.	MA112	Wang, Jif.	TB104	Xi, C.	MB208, FA206
Ultman, J.S.	FA205	Wang, K.W.	TB108	Xia, H.	WA3
Urgessa, G.	WA203	Wang, L.	WA218	Xiang, Y.	FA3
Utz, M.	RC2	Wang, L.-P.	TC211	Xiao, H.	TB203
Vahey, D.W.	TC104	Wang, Q.	MA107	Xiao, Z.	TC211
Vaillant, R.	MA219	Wang, R.	TA203	Xiong, L.	MA203, RA112, RC207
Vainchtein, A.	MB1, RC107	Wang, W.	TB112	Xu, B.	WA105, RA108
Vainchtein, D.	TA219, RC104	Wang, Xian.	RA104, RA112	Xu, D.	MC206, FA106
Vakakis, A.	MC3	Wang, Xiao	RB107	Xu, F.	TB207, RB106
Valdevit, A.	MA206	Wang, Xin	TA208	Xu, J.	MA219, MC211

Xu, W.	TB3	Yun, H.-D.	TC108	Zhao, Ha.	MB203, RC109
Yakhot, V.	TC211	Yung, C.W.	MC211	Zhao, Hu.	FA203
Yamaguchi, E.	WA205	Yvonnet, J.	MA203, TA207	Zhao, J.	RB203
Yan, F.	MB108, TA108	Zaeem, M.A.	MA112	Zhao, Xiaol.	MB108
Yan, W.M.	TA109	Zahn, J.D.	MB219	Zhao, Xiaop.	WA3
Yang, B.	MB105	Zainuddin, S.	WA104	Zhao, Xu.	TC218, WA2, RB2, RC106
Yang, C.	MB4	Zakani, S.	TB211	Zhao, Y.	FA206
Yang, Ji.	FA3	Zakrzhevsky, M.V.	TA3	Zheng, L.	RA219
Yang, Ju.	TA109	Zamankhan, P.	WA205, RC205	Zheng, X.	WA208
Yang, J.Y.	TA108	Zareian, R.	RC206	Zheng, Y.	RC205
Yang, L.	RA105	Zaretsky, U.	RB205	Zhigilei, L.V.	MC203
Yang, M.	MC106	Zaugg, B.	MA208	Zhong, Y.	RA207
Yang, Q.	TB104, TC2, TC203	Zavattieri, P.	TB206	Zhou, K.	RB112
Yang, S.	RC206	Zehnder, A.	TC104	Zhou, M.	MB218
Yang, X.	MB105	Zeng, X.	TC208	Zhou, Q.	WA104
Yao, H.	RB206	Zha, G.	FA1	Zhou, S.	MB104
Ye, W.	MA208	Zhang, B.	WA211	Zhou, Y.	FA4
Yen, C.	TC104	Zhang, D.-B.	MC207	Zhou, Zhi.	TB104
Yen, J.	WA219	Zhang, H.	RC104	Zhou, Zho.	TB105
Yeung, P.	TA205, TC211	Zhang, Jia	MB219	Zhu, C.	TB208
Yevstignejev, V.Y.	TA3	Zhang, Jia.	RC106	Zhu, G.	MB207, TC203, RA109
Yi, X.	RA206	Zhang, Jing	TA104	Zhu, Q.	TB203
Yildirim, B.	WA107	Zhang, Jing.	RA4	Zhu, T.	TA2, TA208, RA207
Yin, J.	MC206, TB206, FA206	Zhang, Li	MA108, MC108	Zhu, Y.	TB207, RB106
Yin, Y.	FA205	Zhang, Li.	TB203	Zikry, M.M.	MC203, TC1
Ying, W.	TC112	Zhang, N.	RB206, FA207	Zimmer, J.	WA109
Yoder, N.C.	WA108	Zhang, S.	MB105, MC105, TA206, TC2, TC208, RB208	Zimmerman, J.	WA112, RB207
Yonten, K.	TB218, WA203	Zhang, W.	RB108	Zohdi, T.	MC104
Young, Y.L.	TB203	Zhang, Xiaoj.	FA208	Zong, Z.	MA105
Yu, J.	MB109, MC109	Zhang, Xiaoy.	TA4	Zou, J.	TA206
Yu, M.	WA108	Zhang, Xin	TB109, WA208, FA108	Zu, J.W.	TB3, RA203
Yu, W.	MC106, FA109	Zhang, Yan	WA203	Zulehner, W.	MC112
Yu, X.	TC1, WA211	Zhang, Yan.	FA108	Zupan, D.	TC203, FA3
Yu, Z.	RC4	Zhang, Yo.	TB112	Zupan, E.	TC203
Yuan, H.	TC2, TC208, RB208	Zhang, Y.W.	MA105, RC211	Zwink, B.	TB108
Yuan, R.	RB2	Zhang, Z.	MA105, MC207, RB207		
Yun, G.	RB207				

LOGISTICS

Registration

Registration Fees

- Full Registration: \$650
- One-Day Registration: \$450
- Student Registration (must be full-time student): \$150

Note: Post doctoral students must register at the Full Registration fee.

Fees: The fees cover the items and meals as indicated below. Registrants are responsible for all other meals and lodging.

Registration Policies:

- **Full Registration Fee** includes a CD-rom of conference proceedings (all extended abstracts), daily lunches, and one ticket for the Wednesday evening banquet.
- **One-Day Registration** includes a CD-rom of conference proceedings (all extended abstracts), admission to technical sessions for one day, and lunch for one day. If attending Wednesday evening banquet, one-day registrants must purchase banquet ticket (\$50 additional fee).
- **Student Registration** (must be full-time student—university photo and evidence of current registration status required at on-site registration desk) includes a CD-rom of conference proceedings (all extended abstracts) and daily lunches. If attending Wednesday evening banquet, student registrants must purchase banquet ticket (\$50 additional fee).

Registration Hours

The UNSCTAM 2010 registration desk will be open during the following hours, to provide advance registrants with their materials, to process on site registrations, and to provide conference information:

Sunday, June 27, 2010	3:00 p.m. – 6:00 p.m.
Monday, June 28, 2010	7:00 a.m. – 3:00 p.m.
Tuesday, June 29, 2010	7:00 a.m. – 3:00 p.m.
Wednesday, June 30, 2010	7:00 a.m. – noon
Thursday, July 1, 2010	7:00 a.m. – 3:00 p.m.
Friday, July 2, 2010	7:00 a.m. – noon

Congress Parking

Parking is free in the lot surrounding the Penn Stater Conference Center Hotel.

Buses and Shuttles

Buses

The Centre Area Transportation Authority (CATA) provides bus service to the town of State College and the Penn State campus (<http://www.catabus.com/>). The White Loop, Blue Loop, Green Link, and Red Link which serve the campus are free to all riders. Fares on all other CATA buses are \$1.25 (exact change only); children under 40-inches tall ride for free when accompanied by an adult.

Shuttle Service to Downtown Hotels

Complimentary shuttle service via 14-seat passenger vans will be provided to USNCTAM conference participants staying at the Atherton Hotel and Days Inn Penn State to and from the Penn Stater Conference Center Hotel. Shuttle service will be available via the main entrance/lobby of the respective hotels with service expected approximately every 15 to 30 minutes during the following schedule:

Sunday, June 27	4:00 p.m. – 7:00 p.m.
Monday, June 28	7:00 a.m. – 10:00 a.m. 5:00 p.m. – 8:00 p.m.
Tuesday, June 29	7:00 a.m. – 10:00 a.m. 5:00 p.m. – 8:00 p.m.
Wednesday, June 30	7:00 a.m. – 1:30 p.m. 5:30 p.m. – 10:00 p.m.
Thursday, July 1	7:00 a.m. – 10:00 a.m. 3:00 p.m. – 6:00 p.m.
Friday, July 2	7:00 a.m. – 1:30 p.m.

Internet Access

The Penn Stater has free wireless internet availability (network name: AttWifi_Meeting). In addition, there are three complimentary computers available for checking e-mail at both the first and second floor break areas of the Penn Stater Conference Center Hotel.

Presentation Information for Authors and Session Chairs

- Speakers are expected to bring their own laptop for presentations. An LCD projector (1024 by 768 native resolution), video cable, projection screen, and microphone are provided in each breakout room.
- Session chairs and speakers must adhere rigorously to the published schedule. If a speaker does not show up, the session chair must call for a break until the scheduled time of the next presentation

- Standard presentations are limited to 25 minutes, including questions/answers and laptop exchange at the podium.
- Keynote presentations are limited to 50 minutes, including questions/answers and laptop exchange.
- Plenary presentations are scheduled for 40 minutes plus 10 minutes for questions/answers.
- Session chairs are responsible for introducing speakers, moderating the discussions, facilitating the exchange of laptops at the podium, and following the schedule.
- Travel Award recipients will be assigned to breakout rooms to assist session chairs and authors with computer connections, room lighting, projection equipment problems, etc.

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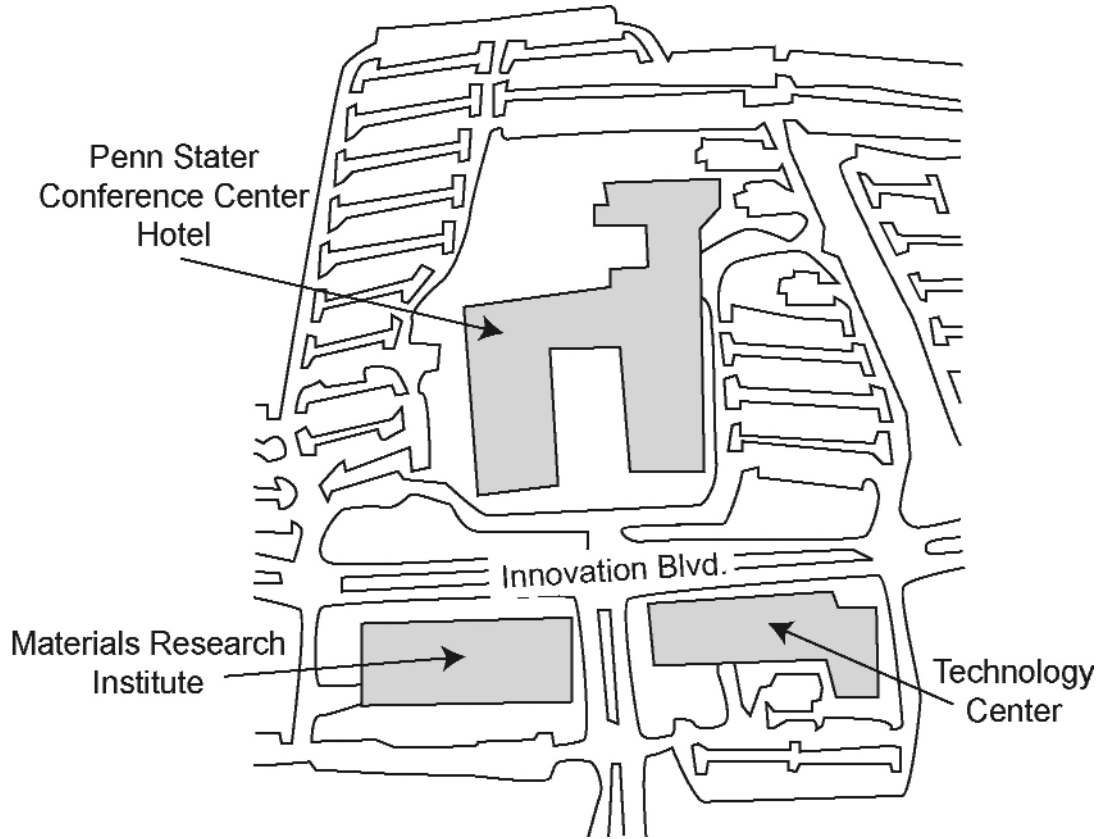
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PAST, PRESENT, AND FUTURE US NATIONAL CONGRESSES

Year	Number	Institution	City and State	Congress Chair(s)
1951	I	Illinois Institute of Technology	Chicago, IL	L. H. Donnell
1954	II	University of Michigan	Ann Arbor, MI	E. L. Eriksen
1958	III	Brown University of	Providence, RI	W. Prager
1962	IV	University of California	Berkeley, CA	W. W. Soroka
1966	V	University of Minnesota	Minneapolis, MN	B. J. Lazan
1970	VI	Harvard University	Cambridge, MA	G. F. Carrier
1974	VII	University of Colorado	Boulder, CO	S. K. Datta
1978	VIII	University of California, Los Angeles	Los Angeles, CA	J. D. Cole
1982	IX	Cornell University	Ithaca, NY	Y. H. Pao
1986	X	University of Texas	Austin, TX	E. B. Becker
1990	XI	University of Arizona	Tucson, AZ	C. F. Chen
1994	XII	University of Washington	Seattle, WA	A. S. Kobayashi
1998	XIII	University of Florida	Gainesville, FL	M. A. Eisenberg
2002	XIV	Virginia Tech	Blacksburg, VA	R. C. Batra and E. G. Henneke
2006	XV	University of Colorado	Boulder, CO	T. L. Geers and S. Sture
2010	XVI	Penn State	University Park, PA	J. A. Todd and C. E. Bakis
2014	XVII	Michigan State	Lansing, MI	J. F. Foss and T. J. Pence

MAPS AND FLOOR PLANS

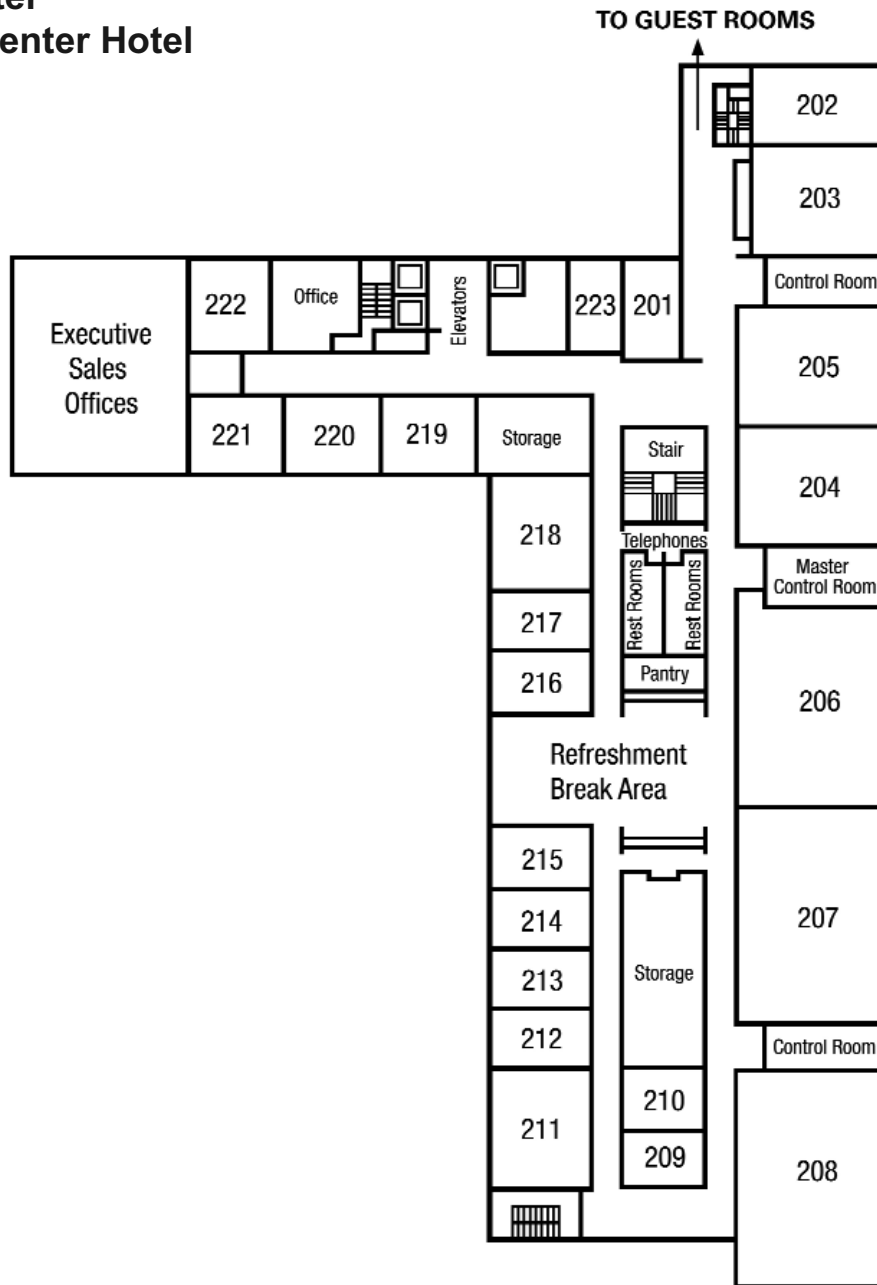
Innovation Park



MAPS AND FLOOR PLANS

The Penn Stater
Conference Center Hotel

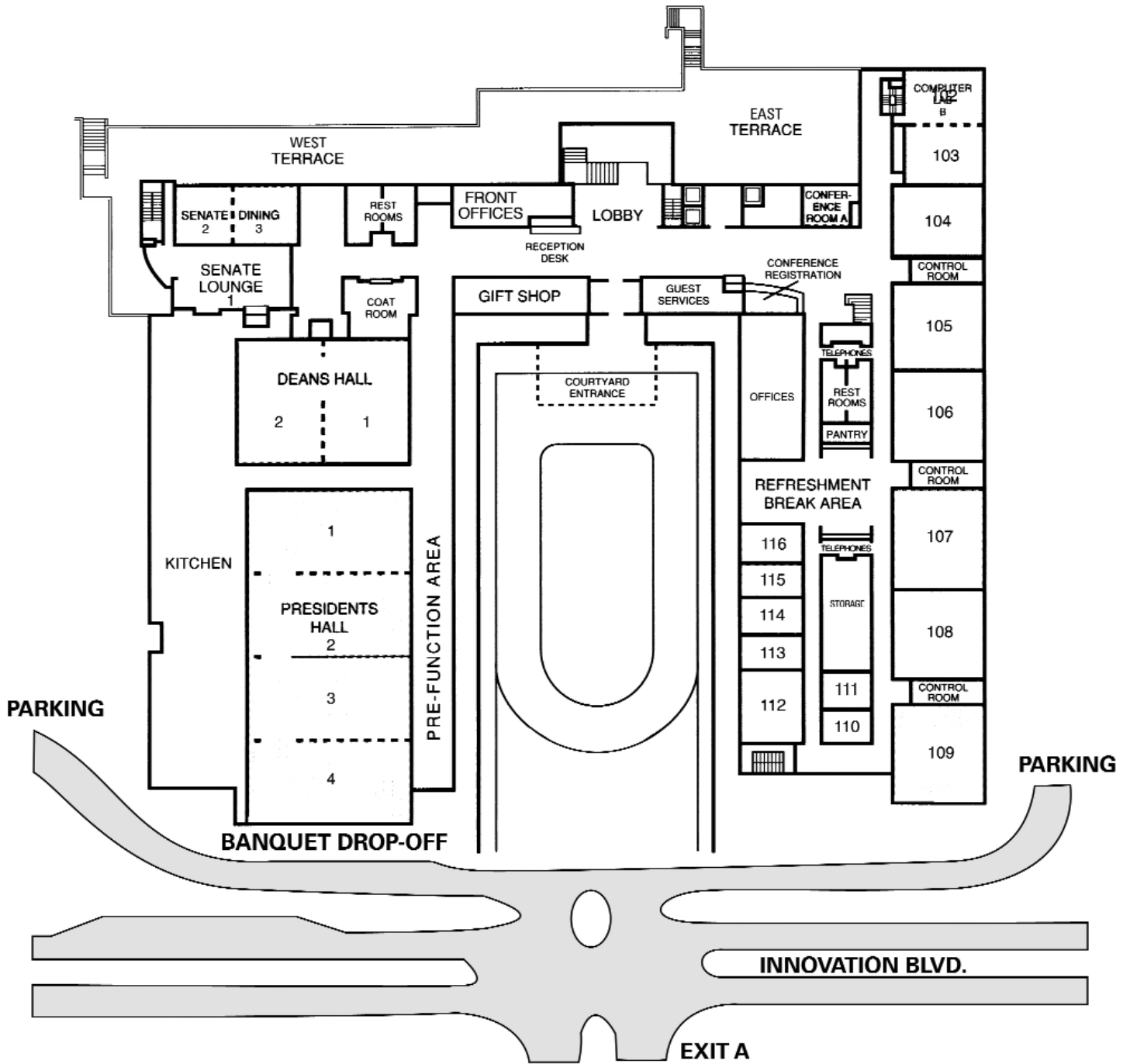
Second Level



MAPS AND FLOOR PLANS

The Penn Stater Conference Center Hotel

Main Level



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