

# USNCTAM 2014 Addendum

**Please note:** The following changes and corrections were made after the program book went to print. Some sessions had been omitted and others had time changes.

**Room change:** On Thursday in Block C at 3:40 p.m., Session F04 will be held in the Galaxy Room, instead of the Red Cedar Room.

## Monday, June 16, 2014: Block A

### Mechanics of Solids and Structures

#### Session S14: Mechanics of Energy Storage

MINI-SYMPOSIUM ORGANIZERS: Marc Kamlah, Karlsruhe Institute of Technology; Robert M. McMeeking, University of California at Santa Barbara, Aberdeen University and INM Leibniz Institute for New Materials; Petros Sofronis University of Illinois at Urbana-Champaign and International Institute for Carbon Neutral Energy Research; Huaiyu Shao, Kyushu University and International Institute for Carbon-Neutral Energy Research

#### Block Title: Mechanical Aspects of Degradation of Lithium Ion Batteries

SESSION CHAIR: Marc Kamlah, Karlsruhe Institute of Technology

#### Corniche

#### 9:40 am

327 - *Core-shell Structures and Lithium Ion Batteries*  
Mark Verbrugge, Yue Qi, Daniel Baker, Yang-Tse Cheng

#### 10:20 am

873 - *Mechanical Degradation of LiMn<sub>1.95</sub>Al<sub>0.05</sub>O<sub>4</sub> Particles*  
Di Chen, Zungsun Choi, Dominik Kramer, Reiner Moenig

#### 11:00 am

788 - *Coupling between Electrode Mechanics, Structures, Electron-/ion-Transport Properties and the Electrochemical Long-term Performance of Lithium Ion Batteries*  
Wolfgang Haselrieder, Rabea Grisat, Arno Kwade

#### 11:20 am

343 - *Fracture in Storage Particles of Li-Ion Batteries – Aspects of Modeling the Coupled Interplay between Diffusion, Stresses and Crack Growth*  
Markus Klinsmann, Daniele Rosato, Robert McMeeking, Marc Kamlah, Robert Bosch

## Monday, June 16, 2014: Block B

### Mechanics of Solids and Structures

#### Session S14: Mechanics of Energy Storage

MINI-SYMPOSIUM ORGANIZERS: Marc Kamlah, Karlsruhe Institute of Technology; Robert M. McMeeking, University of California at Santa Barbara, Aberdeen University, and INM Leibniz Institute for New Materials; Petros Sofronis, University of Illinois at Urbana-Champaign and International Institute for Carbon Neutral Energy Research; and Huaiyu Shao, Kyushu University and International Institute for Carbon-Neutral Energy Research

#### Block Title: Modeling Stress Generation in Electrodes of Lithium Ion Batteries

SESSION CHAIR: Huaiyu Shao, Kyushu University

#### Corniche

#### 1:30 pm

601 - *Design of Electrochemical Shock Resistant Ion-Intercalation Materials*  
William Woodford, W. Craig Carter, Yet-Ming Chiang,

#### 2:10 pm

282 - *A Cahn-Hilliard-type Phase-Field Theory for Species Diffusion Coupled with Large Elastic Deformations*  
Claudio Di Leo, Elisha Rejovitzky, Anand Lallit

#### 2:30 pm

371 - *Phase-Field Model for the Interplay of Diffusion and Stresses in Cathodic Particles of Lithium Ion Batteries : A Study of the Influence of the Particle Geometry*  
Magalie Huttin, Marc Kamlah

#### 2:50 pm

309 - *Influence of Three-Dimensional Lithium Ion Battery Electrode Microstructure on Mechanical Stresses within Electrode Particles*  
Michael Kespe, Hermann Nirschl, Willy Dörfler

## Monday, June 16, 2014: Block C

### Mechanics of Solids and Structures

#### Session S14: Mechanics of Energy Storage

MINI-SYMPOSIUM ORGANIZERS: Marc Kamlah, Karlsruhe Institute of Technology; Robert M. McMeeking, University of California at Santa Barbara, Aberdeen University, and INM Leibniz Institute for New Materials; Petros Sofronis, University of Illinois at Urbana-Champaign and International Institute for Carbon Neutral Energy Research; and Huaiyu Shao, Kyushu University and International Institute for Carbon-Neutral Energy Research

#### Block Title: Morphology of SOFC and LIB

SESSION CHAIR: Huaiyu Shao, Kyushu University

#### Corniche

#### 3:40 pm

887 - *New Foundations for Multi-Scale Design of Heterogeneous Functional Materials (HeteroFoam) for Energy Conversion and Storage*  
Ken Reifsnider, Fazel Rabbi, Jeffrey Baker, Kyle Brinkman, Daniel Cacuci

#### 4:20 pm

1125 - *Chemo-Mechanics of Lithiation of Silicon Anodes* Andrew Drach  
Shannon Stauffer, Graeme Henkelman, Gregory Rodin

#### 4:40 pm

564 - *Numerical Investigation of Microstructural Influence on the Effective Conductivity of Granular Electrode Structures*  
Julia Ott  
Yixiang Gan, Robert M. McMeeking, Marc Kamlah

## Tuesday, June 17, 2014: Block C

### Dynamics

#### Session D14: Reduced Order Modeling for Complex Systems

MINI-SYMPOSIUM ORGANIZERS:

Brian Feeny, Michigan State University; Francis Moon, Cornell University

#### Block Title: Reduced Order Modeling for Complex Systems I

SESSION CHAIRS: Kiran D'Souza and Bogdan Epureanu, University of Michigan

#### Centennial C

##### 3:40 pm

1110 - *A Global/Local Nonlinear System Identification Approach of Broad Applicability*

Mehmet Kurt, Melih Eriten, D. Michael McFarland, Lawrence A. Bergman, Alexander F. Vakakis

##### 4:00 pm

1008 - *Structural Dynamic Models of Battery Packs: Effects of Parametric Variability*

Jauching Lu, Kiran D'Souza, Bogdan Epureanu, Matthew Castanier

##### 4:20 pm

1249 - *Complex Modal Analysis Of A Non-Modally Damped Wind Turbine Blade*

Xing Xing, Brian Feeny

##### 4:40 pm

634 - *Lower-Wing Structural Dynamics and Flutter in V-Strut Biplanes*

Arion Pons, Stefanie Gutschmidt

## Wednesday, June 18, 2014: Block A

### Biomechanics

#### Session B05: Mechanics of Biological Materials

MINI-SYMPOSIUM ORGANIZER: Iwona Jasiuk, University of Illinois at Urbana-Champaign

#### Block Title: Bone Mechanics

SESSION CHAIR: Iwona Jasiuk, University of Illinois at Urbana-Champaign

#### Big Ten B

##### 9:40 am

1109 - *Towards an In-Vivo Prediction of Bone Quality Using Reference Point Indentation*

Alexander Setters, Iwona Jasiuk

##### 10:00 am

942 - *Multimodal Determination of the Biomechanical Properties of the Bone-Implant Interface*

Guillaume Haiat

##### 10:40 am

921 - *Unloading is the Key to Quasi-Static Determination of Cortical Bone Elasticity: Evidence from Ultrasound, Wetting and Weighing Tests, as well as from Micromechanics Theory*

Christoph Schwaiger, Krzysztof Luczynski, Maria-Ioana Pastrama, Claire Morin, Christian Hellmich

##### 11:00 am

1154 - *Characterization of Structural Parameters and Properties of Bone by Spectral Measure Method*

Elena Cherkaev, Carlos Bonifasi-Lista

##### 11:20 am

1278 - *A Mechano-Biological Model of Intramembranous/Endochondral Ossification: The Clavicle Case*

Diego Garzon-Alvarado

## Wednesday, June 18, 2014: Block B

### Mechanics of Solids and Structures

#### Session S21: Symposium Honoring Professor Lallit Anand on the Occasion of his 65th Birthday

MINI-SYMPOSIUM ORGANIZER: David L. Henann, Brown University; Shawn Chester, New Jersey Institute of Technology; Yujie Wei, Chinese Institute of Mechanics; Curt Bronkhorst, Los Alamos National Laboratory; and Ken Kamrin, Massachusetts Institute of Technology

#### Block Title: Anand III

SESSION CHAIR: Curt Bronkhorst, Los Alamos National Laboratory

#### Heritage

##### 1:30 pm

565 - *Microscale-calibrated Modeling of the Deformation Response of High-strength Steels*

Allan Bower, Hassan Ghassemi-Armaki, Ankit Srivastava, Hyokyung Sung, Sharvan Kumar

##### 1:50 pm

478 - *Crystal Plasticity Based Constitutive Modeling and Finite Element Simulation of Magnesium and Its Alloy*

Jiahao Cheng, Somnath Ghosh

##### 2:10 pm

645 - *Some Observations on the Strengthening and Hardening Effects in Nanotwined Metals and their Theoretical Explanation*

Yujie Wei

##### 2:30 pm

984 - *On the Nature of Deformation Evolution in Magnesium Single Crystals Subjected to Localized Contact*

Balaji Selvarajou, Shailendra Joshi

##### 2:50 pm

1061 - *High-Temperature Discrete Dislocation Plasticity*

Amine Benzerga, Shyam Keralavarma

## Wednesday, June 18, 2014: Block C

### Fluid Mechanics

#### Session F03: Bioflight I: Models (Experimental, Numerical and Theoretical)

MINI-SYMPOSIUM ORGANIZERS: Ahmed Naguib, Michigan State University; Geoffrey R. Spedding, University of Southern California

#### Block Title: Bioflight Ic

SESSION CHAIR: Luis Bernal, University of Michigan

#### Galaxy Room

#### 3:40 pm

934 - *Models of Flapping Wing Flight: Transients in Translation and Rotation*

Anya Jones

#### 4:00 pm

959 - *Flow Structure and the Connection with Forces on a Wing in Surging Flow*

Bruno Monnier, David Williams

#### 4:20 PM

1004 - *Force Generation and Vortex Dynamics in Bio-Inspired Flight*

Luis Bernal, Huai-Te Yu

#### 4:40 PM

1248 - *Forces and Flow Structure on an Airfoil Pitching Asymmetrically at High Reduced Frequency*

Patrick Hammer, Ahmed Naguib, Manoochehr Koochesfahani, Miguel Visbal

## Thursday, June 19, 2014: Block A

### Mechanics of Solids and Structures

#### Session S22: Symposium in Honor of Alan Wineman on the Occasion of his 50th Year at the University of Michigan

MINI-SYMPOSIUM ORGANIZERS: John Shaw, University of Michigan; Samantha Daly, University of Michigan, Anthony Waas, University of Michigan

#### Block Title: Biomechanics

SESSION CHAIR: John Shaw, University of Michigan

#### Lincoln

#### 9:40 am

1092 - *Mechanics of Lipid Bilayer Membranes*  
Chun Il Kim, David Steigmann

#### 10:00 am

312 - *A Football Helmet Design Strategy for Concussion Protection*  
Tanaz Rahimzadeh, Anthony Waas, Ellen M. Arruda, M. D. Thouless

#### 10:20 am

307 - *The Role of Dystrophins on Lateral Transmission of Force in Skeletal Muscle*  
Chi Zhang, Yingxin Gao

#### 10:40 am

727 - *Cervical Tissue Remodeling and Collagen Crosslink Turnover in Pregnancy*

Kristin Myers, Kyoko Yoshida, Mala Mahendroo, Joy Vink, Ronald Wapner

#### 11:00 am

792 - *A Simple Model for Myocardial Changes in a Failing Heart*

John Shaw, Alan Wineman, Kannan Dasharathi, Ming Si

## Thursday, June 19, 2014: Block B

### Mechanics of Solids and Structures

#### Session S21: Symposium Honoring Professor Lallit Anand on the Occasion of his 65th Birthday

MINI-SYMPOSIUM ORGANIZERS: David L. Henann, Brown University; Shawn Chester, New Jersey Institute of Technology; Yujie Wei, Chinese Institute of Mechanics; Curt Bronkhorst, Los Alamos National Laboratory; Ken Kamrin, MIT

#### Block Title: Anand V

SESSION CHAIR: Yujie Wei, Chinese Institute of Mechanics

#### Auditorium

#### 1:30 pm

413 - *Constitutive Model of Dynamic Metal Viscoplasticity with Application to Powder Shock Compression*

Ryan Austin, David McDowell

#### 1:50 pm

1152 - *On Modeling Microvoid Coalescence under Combined Tension and Shear*

Mohammad Torki, Amine Benzerga, Jean-Baptiste Leblond

#### 2:10 pm

778 - *Effect of Lode Parameter on Plastic Localization in Advanced High Strength Steels*

Dirk Mohr, Matthieu Dunand

#### 2:30 pm

321 - *Dislocation-Based Gradient Plasticity*  
Nasrin Taheri Nassaj, Hussein M. Zbib