

IUTAM Symposium on Mechanics of Soft Active Materials



TECHNION - Israel Institute of Technology
Faculty of Civil & Environmental Engineering
National Building Research Institute

May 12-15, 2014
Butler Auditorium, Samuel Neaman Institute, Technion

SCHEDULE

May 11, 2014

19:00 **Reception**
Hotel Dan Panorama (Pitagoras Hall)
107 Hanassi Avenue, Haifa 34632
Tel. 04-8352222

May 12, 2014

08:30 **Registration**

09:30 Opening

Session 1 (Chairman P. Purohit)

09:40 Opening Lecture
SOFT MATERIALS AND SOFT MACHINES
Z. Suo

10:20 **THERMO-MECHANICS OF AMORPHOUS SHAPE MEMORY POLYMERS**
T.D. Nguyen

10:40 **ELECTROELASTIC STABILITY**
L. Dorfmann, R. Ogden

11:00 **ACTIVE COMPOSITES BY 4D PRINTING**
Q. Ge, M.L. Dunn, H.J. Qi

11:20 **Coffee break**

Session 2 (Chairman O. Lopez-Pamies)

11:40 **GEL MECHANICS: A THERMO-MECHANICALLY COUPLED THEORY FOR FLUID PERMEATION IN ELASTOMERIC MATERIALS**
L. Anand, S. Chester

12:00 **POLYCONVEX FREE ENERGY TERMS FOR ELECTRO- AND MAGNETO-ACTIVE MATERIALS**
M. Itskov

12:20 **IONIC CONTROL OF CRACK PROPAGATION IN BIOPOLYMER HYDROGELS**
T. Baumberger, O. Ronsin

12:40 **THREE-DIMENSIONAL MUSCLE MODELING – EXPERIMENT AND SIMULATION**
M. Bol, M. Sturmat, M. Ernst, T. Siebert

13:00 **Lunch**

Session 3 (Chairman M. Gei)

14:00 **FLUIDIZATION BY STRETCH IN THE JAMMED EPITHELIAL MONOLAYER**
B. Gweon, C-Y. Park, J. Shin, J. Butler, J. Fredberg

14:20 **NEURONAL CELLS: TENSION INDUCED GROWTH AND MEMBRANE MECHANICS**
P. Purohit

14:40 **CELL STIFFNESS AS A BIOMARKER FOR THE RETRIEVAL OF CIRCULATING TUMOR CELLS FROM PATIENT BLOOD**
C.T. Lim

15:00 **CANCER CELLS TENACIOUSLY INDENT IMPENETRABLE, SOFT GELS**
R. Kristal-Muscal, L. Dvir, R. Nissim, D. Weihs

15:20 **Coffee break**

Session 4 (Chairman M. Bol)

15:40 **OPTIMIZATION OF LOAD-DRIVEN SOFT DIELECTRIC ELASTOMER GENERATORS**

E. Bortot, G. deBotton, M. Gei

16:00 **PHASE-FIELD MODEL FOR SOLID DIELECTRIC BREAKDOWN**
W. Hong

16:20 **A HISTOMECHANICAL GROWTH AND REMODELING FRAMEWORK FOR ARTERIES**
T.C. Gasser

May 13, 2014

Session 1 (Chairman V. Nguyen)

09:30 **BIOMIMETIC MICROPATTERNED SURFACES FOR INTERACTION WITH SOFT MATTER**
N. Guimard, J. Kaiser, E. Kroner, E. Arzt

09:50 **TOUGH HYDROGELS: PLAY WITH SACRIFICIAL BONDS**
J.P. Gong

10:10 **AN INTERNAL VARIABLE BASED INTERFACE MODEL FOR CHARGING AND PIEZOELECTRICITY IN FERROELECTRICS**
D. Gross, B-X Xu, S. Zhukov, H. von Seggern

10:30 **DYNAMICS OF A DISCRETE CHAIN OF BI-STABLE ELEMENTS: A BIOMIMETIC SHOCK ABSORPTION MECHANISM**
T. Cohen, S. Givli

10:50 **Coffee break**

Session 2 (Chairman S. Goktepe)

11:10 **MECHANISMS OF DEFORMATION OF HUMAN AMNION**
A. Mauri, A.E. Ehret, E. Mazza

11:30 **FINITE ELEMENT MODELING OF THE ELECTROMECHANICAL COUPLING IN ELECTROACTIVE POLYMERS**
M. Jabareen

11:50 **THE COUPLING BETWEEN ELECTROSTATICS AND MECHANICS IN POLYMER NETWORKS**
G. deBotton, N. Cohen

12:10 **DYNAMICS OF BISTABLE CHAINS SUBJECTED TO THERMAL FLUCTUATIONS**

S. Givli and I. Benichou

12:30 Lunch

Session 3 (Chairman D. Ambrosi)

13:30 **SURFACE TENSION OF COMPLIANT SOLIDS**
D. Paretkar, N. Nadermann, X. Xu, C-Y. Hui, A. Jagota

13:50 **SHAPE-MEMORY EFFECT IN POLYMERIC MATERIALS: MECHANISMS AND OPTIMIZATION**
W.M. Huang

14:10 **FULLY COUPLED CARDIAC ELECTROMECHANICS WITH ORTHOTROPIC VISCOELASTIC EFFECTS**
M. Kaliske, F.B. Can Cansiz, H. Dal

14:30 **CELL REORIENTATION UNDER CYCLIC STRETCHING**
A. Livne, E. Bouchbinder, B. Geiger

14:50 Coffee break

Session 4 (Chairman M. Jabareen)

15:10 **GELS FOR CELLS: SOFT ACTIVE HYDROGELS FOR TISSUE REGENERATION AND BIOTECHNOLOGY**
D. Seliktar, A. Berdichevski

15:30 **MODELING OF VISCOUS ELECTROSTRICTIVE POLYMERS**
A. Ask, A. Menzel, M. Ristinmaa

15:50 **MODELING AND EXPERIMENTS IN GELS**
J. Huyghe

19:00 Gala Dinner
Hotel Dan Panorama (Pitagoras Hall)
107 Hanassi Avenue, Haifa 34632
Tel. 04-8352222

May 14, 2014

Session 1 (Chairman W. Hong)

09:30 **ELASTIC DIELECTRIC COMPOSITES: THEORY AND APPLICATION TO PARTICLE-FILLED IDEAL DIELECTRICS**
O. Lopez-Pamies

09:50 **THERMO-VISCO-HYPERELASTICITY OF ELECTRO-ACTIVE SOFT TISSUES**
A. Gizzi, C. Cherubini, S. Fillipi, A. Pandolfi

10:10 **MODELING THE MECHANOBIOLOGY OF ANEURYSM EVOLUTION**
E. Dickinson, H. Chen, K. Mandalitsi, P. Aparicio, J. Hornsby, P. Watton

10:30 **SOLID FLOW FIELDS AND GROWTH OF SOFT SOLID MASS**
D. Durban, Y. Dafalias, T. Cohen

10:50 **Coffee break**

Session 2 (Chairman P. Watton)

11:10 **A MODEL FOR THE INTERACTIONS OF CYTOSKELETON REMODELING, CONTRACTILE STRESSES AND SIGNALING FOR A CELL ON A GROOVED SUBSTRATE**
R.M. McMeeking, A. Vigliotti, V.S. Deshpande, N. Gadegaard

11:30 **MAGNETOELASTIC ELASTOMERS: PERIODIC VERSUS RANDOM MICROSTRUCTURES**
E. Galipeau, S. Rudykh, G. deBotton, P. Ponte Castaneda

11:50 **PASSIVE AND ACTIVE MECHANICAL RESPONSE OF HUMAN ARTERIES**
Z. Yosibash

12:10 **ACTIVE STRESS AS A LOCAL REGULATOR OF GLOBAL SIZE IN MORPHOGENESIS**
D. Ambrosi, V. Pettinati, P. Ciarletta

12:30 **Lunch**

Session 3 (Chairman A. Pandolfi)

13:30 **SWELLING-DRIVEN SHAPING OF RESPONSIVE POLYMER SHEETS AND MULTILAYERS**
R.C. Hayward

13:50 **COMPUTATIONAL MODELING OF CARDIAC DYSFUNCTIONS**
S. Goktepe, E. Berberoglu

14:10 **MECHANICS OF BIO-HYBRID SYSTEMS**
A. Lucantonio, P. Nardinocchi, M. Pezzulla, L. Teresi

14:30 **FIBROTIC CARDIOMYOPATHY RECONSTITUTED IN HYDROGEL SCAFFOLDS**
G.M. Genin, T.M. Abney, B. Babaei, A. Davarian, D. Guo, W.B. McConnaughey, N. Pittore, K.M. Pryse, F. Xu, T. Wakatsuki, E.L. Elson

14:50 **Coffee break**

Session 4 (Chairman P. Nardinocchi)

15:10 **DYNAMIC INFLATION OF HYPERELASTIC SPHERICAL MEMBRANES: REMARKS ON THE ROLE OF CONSTITUTIVE RELATION**
J.A. Rodriguez-Martinez, J. Fernandez-Saez, R. Zaera

15:30 **MODELING ANEURYSM GROWTH AND RUPTURE**
K.Y. Volokh

15:50 Closing Lecture
TBA
D. Weitz

May 15, 2014

Tour to Jerusalem

(07:00 – 17:00)

On the way back to Haifa the bus will stop at the Ben-Gurion Airport and in Tel Aviv (if necessary).

Special bus circulation between Dan Hotels and Technion:

May 12: Dan Hotels – Technion (Butler Auditorium) **07:30**

May 12: Technion (Butler Auditorium) – Dan Hotels **17:00**

May 13: Dan Hotels – Technion (Butler Auditorium) **08:40**

May 13: Technion (Butler Auditorium) – Dan Hotels **16:30**

May 13: Technion (Butler Auditorium) – Dan Hotels **18:30**

May 13: Dan Hotels – Technion (Butler Auditorium) **21:30**

May 14: Dan Hotels – Technion (Butler Auditorium) **08:40**
May 14: Technion (Butler Auditorium) – Dan Hotels **17:00**

Organizers' contact phones

Kosta (Konstantin Volokh): +972-544236592 or 0-544236592 (local)
Mahmood (Mahmood Jabareen): +972-548339802 or 0-548339802 (local)