

## Wednesday, June 19th, 2002

8:30 am – 9:45 am

**Registration**

SFU Theatre, Convocation Mall

Room: SFU Theatre, Convocation Mall

9:45 am – 10:00 am

Welcome Address

### PLENARY LECTURE

Room: SFU Theatre, Convocation Mall

10:00 am – 11:00 am

**Steady, Structured Shock Waves: Thermoelastic Materials**  
R. Fosdick

11:00 am ñ 11:40 am

Coffee Break and Refreshments

SFU Theatre, Convocation Mall

### GREEN MINI-SYMPIOSIUM Part I

Organizer: **Patrick Selvadurai**

Chairs: P. Selvadurai/A.J.M. Spencer

Room: SFU Theatre, Convocation Mall

11:40 am – 12:00 noon

**Theory of Nonlinear Viscoplastic Materials with Transversely  
Isotropic Symmetry**  
A.J.M. Spencer

12:00 noon – 12:20 pm

**Unsheared Triads and Extended Polar Decompositions in  
Finite Strain**  
P. Boulanger, M. Hayes\*

12:20 pm – 12:40 pm

**Anode Gas Diffusion Electrode of a Proton Exchange Membrane Fuel Cell: A Mixture Model of an Elastic Porous Solid Filled with Fluids**  
S. Gursan

**Wednesday, June 19th, 2002**

12:40 pm – 2:10 pm

Lunch

**MINI-SYMPOSIUM  
on Non-Linear Multiscale Analysis of Structures**

Organizers: **P. Kanouté, F. Féyel**

Chairs: P. Kanouté, R. Parnes

Room: SFU Theatre, Convocation Mall

2:10 pm – 2:30 pm

**A Micromechanical Multi-Layer Model for Tial Lamellar Grains**  
L. Gelebart\*, M. Bornert, J. Crepin, T. Bretheau

2:30 pm – 2:50 pm

**Two-Scale Finite Element Modeling of Lamellar Microstructures**  
M. Werwer\*, A. Cornec

2:50 pm – 3:10 pm

**Multiscale Modelling of Non-Linear Behaviour of Heterogeneous Materials: Comparison of Several Homogenisation Methods**  
P. Kanouté\*, F. Féyel, S. Kruch, N. Carrère, J. L. Chaboche

3:10 pm – 3:30 pm

**Bone as a Hierarchical Material: Characterization and Modeling**  
I. Jasiuk

3:30 pm ñ 4:10 pm

Coffee Break and Refreshments SFU Theatre, Convocation Mall

4:10 pm – 4:30 pm

**New Micro-Macro Approach for Elastic-Viscoplastic Materials Based On Translated Fields**  
V. Favier\*, H. Sabar, M. Berveiller, S. Berbenni

4:30 pm – 4:50 pm

**Effective Hyperelastic Properties of a Steel–Wire Reinforced Elastomer: Homogenization and Experiments**

N. Lahellec\*, F. Mazerolle, J. C. Michel

6:00 p.m

*Welcome Reception at Diamond University Centre*

**Wednesday, June 19th, 2002**

**MINI-SYMPOSIUM  
on Modern Trends in Elasticity  
Part I**

Organizers: **Peter Schiavone**

Chairs: P. Schiavone/A. Mioduchowski

Room: Images Theatre, Academic Quadrangle

|                   |   |
|-------------------|---|
| 2:10 pm – 2:30 pm | <b>Finite Amplitude Waves in a Special Deformed Hadamard Material</b><br>P. Boulanger*, M. Hayes                |
| 2:30 pm – 2:50 pm | <b>On the Uniformity Of Stresses Inside an Inhomogeneity of Arbitrary Shape</b><br>P. Schiavone*, Y. A. Antipov |
| 2:50 pm – 3:10 pm | <b>A Note on Isochoric Problems in Compressible Finite Elasticity</b><br>E. Kirkinis*, R. W. Ogden              |
| 3:10 pm – 3:30 pm | <b>Interaction Between a Screw Dislocation and a Circular Inclusion with Imperfect Interface</b><br>L. J. Sudak |

3:30 pm – 4:10 pm      Coffee Break and Refreshments      SFU Theatre, Convocation Mall

|                   |   |
|-------------------|---|
| 4:10 pm – 4:30 pm | <b>Critical Radial Pressure for Multiwall Carbon Nanotubes</b><br>C. Y. Wang*, C. Q. Ru, A. Mioduchowski                    |
| 4:30 pm – 4:50 pm | <b>Torsion of Cylindrical Beams With Microstructure</b><br>S. Potapenko*, P. Schiavone, A. Mioduchowski                     |
| 4:50 pm – 5:10 pm | <b>The Strain–Energy Function of Tetragonal–Orthorhombic–Monoclinic Zirconia</b><br>G. Fadda, L. Truskinovsky, G. Zanzotto* |

6:00 pm      *Welcome Reception at Diamond University Centre*



## Thursday, June 20th, 2002

### PLENARY LECTURE

Room: SFU Theatre, Convocation Mall

9:00 am – 10:00 am      **Some Recent Developments in the Analysis of Composite Materials**  
John R. Willis

10:00 am – 10:20 am      Coffee Break and Refreshments      SFU Theatre, Convocation Mall

### PLENARY LECTURE

Room: SFU Theatre, Convocation Mall

10:20 am – 11:20 am      **Finite Element Models in the Steel Industry: Modeling of Production Processes**  
E.N. Dvorkin

11:20 am – 11:40 am      Coffee Break and Refreshments      SFU Theatre, Convocation Mall

### MINI-SYMPOSIUM On Inhomogeneous Plane Waves Part I

Organizer: **Michael Hayes**

Chairs: Michael Hayes/Philippe Boulanger

Room: SFU Theatre, Convocation Mall

11:40 am – 12:00 noon      **Surface Stability Analysis of a Predeformed Bell-Constrained Half-Space**  
M. Destrade

12:00 noon – 12:20 am      **Classes of Inhomogeneous Plane Waves in Cubic Crystals**  
P. Boulanger\*, M. Hayes

12:20 am – 12:40 am      **Standing Waves in a Layered Elastic Half-Space in Finite Strain**  
D. A. Sotiropoulos\*, E. Babatsouli

12:40 pm – 2:00 pm      Lunch

2:15 pm

Pick up from Executive Plaza Hotel for the *Thursday P.M. Social*.

## Friday, June 21st, 2002

### PLENARY LECTURE

Room: SFU Theatre, Convocation Mall

9:00 am – 10:00 am

**Concepts and Problems in Dynamic Micromagnetics**  
P. Podio-Guidugli

10:00 am ñ 10:40 am

Coffee Break and Refreshments SFU Theatre, Convocation Mall

### MINI-SYMPOSIUM

**on Modern Perspectives in Continuum Mechanics and the Physical Sciences of Solids  
Part I**

Organizers: **Roger Fosdick, Gianni Royer-Carfani**

Chairs: Roger Fosdick / Gianni Royer-Carfani

Room: SFU Theatre, Convocation Mall

10:40 am ñ 11:00 am

**The Totality of Soft-States an a Neo-Classical Nematic Elastomer**  
D. E. Carlson, E. Fried\*, S. Sellers

11:00 am ñ 11:20 am

**A Non-Local Model for Fractured Bars**  
G. Del Piero

11:20 am ñ 11:40 am

**Phase Transitions in a Discrete Chain With Non-Local Interactions**  
A. Vainchtein\*, L. Truskinovsky

11:40 am ñ 12:00 noon

**Normal-Stress Differences and the Detection of Disclinations in Nematic Elastomers**  
E. Fried, R. E. Todres\*

12:00 noon ñ 12:20 pm

**Numerical Experiments on Fracture of Elastic Solids Through Energy Minimization**  
M. Angelillo\*, E. Babilio, A. Fortunato

12:20 pm ñ 12:40 pm

**Present State and Perspectives in Eshelbian Nonlinear Materials Mechanics, in Light of Recent Advances**  
G. A. Maugin

12:40 pm – 2:10 pm

Lunch

## Friday, June 21st, 2002

### MINI-SYMPOSIUM

#### on Modern Perspectives in Continuum Mechanics and the Physical Sciences of Solids Part II

Organizers: **Roger Fosdick, Gianni Royer-Carfani**

Chairs: Roger Fosdick / Gianni Royer-Carfani

Room: SFU Theatre, Convocation Mall

2:10 pm – 2:30 pm

**On Cavitation, Configurational Forces and Implications for Fracture in a Nonlinearly Elastic Material**

J. Sivaloganathan, S. J. Spector\*

2:30 pm ñ 2:50 pm

**Scale-Dependence of Grade-2 Internal Constraints in Multipolar Elasticity Theory**

R. Fosdick, G. Royer-Carfani\*

### MINI-SYMPOSIUM

#### on Nonlinear Behaviour with Polymers and their Composites

Organizer: **Erol Sancaktar, Arkady Leonov**

Chairs: Erol Sancaktar

Room: SFU Theatre, Convocation Mall

2:50 pm – 3:10 pm

**Nonlinear Response of Polymer Thin Films**

Z. Gao

3:10 pm – 3:30 pm

**Nonlinear Viscoelastic Mechanics of Cross-Linked Rubbers**

A.D. Freed\*, A. I. Leonov

3:30 pm – 3:50 pm

**Apparent Nonlinearities in Mechanical Behavior of Epoxy Based Composite Helical Springs**

E. Sancaktar\*, S. K. Gowrishankar

3:50 pm – 4:10 pm

**Optimization of a Flexible Panel Air Filter Sealing Bead / Housing Interface Using Finite Element Analysis**

E. Azhikannickal\*, P. M. Wild



**Friday, June 21st, 2002**

**MINI-SYMPOSIUM  
on Non-Linear Constitutive Laws of Polymer Solids**

Organizer: **M. Kitagawa**

Chairs: M. Kitagawa/N.D. Heymans

Room: Images Theatre, Academic Quadrangle

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|-----------------------|--|
| 10:40 am – 11:00 am   | <b>Modelling "Unusual" Behaviour Using Hierarchical Viscoelastic Models</b><br>N. D. Heymans                               |
| 11:00 am – 11:20 am   | <b>A Molecular Theory for Stress-Strain Behavior in the Pre-Yield Region of Crystalline Polymer Solids</b><br>K. Nitta     |
| 11:20 am – 11:40 am   | <b>Yield Process of Amorphous Polymers</b><br>M. Kitagawa*, T. Tuzuku, Y. Yamada   |
| 11:40 am – 12:00 noon | <b>Application of Viscoelastic Constitutive Equation to Inelastic Deformation of Epoxy</b><br>M. Mizuno                    |
| 12:00 noon – 12:20 pm | <b>Evolution of Polymeric Structure in Glassy Epoxy Resin Aged Under Shear Strain</b><br>H. Kawakami*, K. Souda, Y. Nanzai |

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| 12:40 pm – 2:10 pm | Lunch |
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## SESSION F-1

Chairs: D. Gross/L. Stepanova

Room: Images Theatre, Academic Quadrangle

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|-------------------|---|
| 2:10 pm ñ 2:30 pm | <b>Element-Size Independent, Elasto-Plastic Damage Analysis of Framed Structures</b><br>Y. Toi*, J.-G. Lee                    |
| 2:30 pm ñ 2:50 pm | <b>On the Geometry of a Totally Damaged Zone Near a Mode III Crack Tip in Creep-Damage Coupled Problem</b><br>L. V. Stepanova |
| 2:50 pm ñ 3:10 pm | <b>A Comparative Study on the Limitations of Damage Models in Ductile Fracture Mechanics</b><br>D. Gross*, H. Baaser          |
| 3:10 pm ñ 3:30 pm | <b>On Directional Average of the Local Anisotropic Damage</b><br>Y. N. Radayev  |

3:30 pm ñ 4:10 pm      Coffee Break and Refreshments      SFU Theatre, Convocation Mall

## MINI-SYMPOSIUM on Modern Trends in Elasticity Part II

Organizers: **Peter Schiavone**

Chairs: P. Schiavone/A. Mioduchowski

Room: Images Theatre, Academic Quadrangle

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|-------------------|---|
| 4:10 pm – 4:30 pm | <b>A Multiple-Elastic Beam Model for Vibration of Multiwall Carbon NanoTubes</b><br>J. Yoon*, C. Q. Ru, A. Mioduchowski |
| 4:30 pm – 4:50 pm | <b>Free Vibrations of Nonuniformly Prestressed Hyperbolic Paraboloid Networks</b><br>A. Mioduchowski                    |

4:50 pm – 5:10 pm

**On the Intrinsic Evolution of Material Inhomogeneities**  
M. Elzanowski\*, M. Epstein

## Saturday, June 22nd, 2002

### PLENARY LECTURE

Room: SFU Theatre, Convocation Mall

9:00 am – 10:00 am                      **Second Order Elasticity for Axisymmetric  
Torsion:**

**A Spheroidal Coordinate Formulation**  
A. P. S. Selvadurai

10:00 am ñ 10:40 am                      Coffee Break and Refreshments      SFU Theatre, Convocation Mall

### SESSION S-1

Chairs: A. Ericksson/B.A. Szabo/S. Ruuth

Room: SFU Theatre, Convocation Mall

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|-----------------------|---|
| 10:40 am – 11:00 am   | <b>Some Aspects of Shell Instability Analyses</b><br>A. Eriksson  |
| 11:00 am – 11:20 am   | <b>Nonlinear Finite Element Modeling of Moisture Migration in a<br/>Masonry Structure With FRP Upgrade</b><br>M. W. Lin*, J. B. Berman, M. Khoshbakht, C. A. Feickert |
| 11:20 am – 11:40 am   | <b>Hierarchic Models in Numerical Simulations</b><br>B. A. Szabo*, R. L. Actis  |
| 11:40 am – 12:00 noon | <b>A Diffusion-Generated Approach to Multiphase Motion</b><br>S. J. Ruuth   |
| 12:00 noon – 12:20 pm | <b>On the Selection of Time-Functions in the Galerkin<br/>Approximation used for the Timoshenko Beam Theory</b><br>M. Dadfarnia, N. Jalili*, E. Esmailzadeh           |

12:20 pm – 12:40 pm

**Simplified Bifurcation Analysis of Circular Thin Plates**

N. N. Alexandrova\*, J. J. A. Gracio

12:40 pm ñ 2:10 pm

Lunch

**SESSION S-2**

Chairs: A. Hanyga/G. Sabin

Room: SFU Theatre, Convocation Mall

2:10 pm – 2:30 pm

**A Variational Formulation for the Pseudo-Linear Model in Finite Strain Viscoelasticity**

A. Alaoui-Soulimani\*, A. Ehrlacher, S. Hassani

2:30 pm – 2:50 pm

**Well-Posedness and Regularity for the Anisotropic Cole-Cole Model of Linear Viscoelasticity**

A. Hanyga

2:50 pm – 3:10 pm

**The Case for Simplified Solutions in Mechanics**

G. C. W. Sabin

3:10 pm – 3:30 pm

**Regularity of Solutions of Nonlinear Problems With Singular Memory**

A. Hanyga

3:30 pm – 3:50 pm

**A New Notion of State in Viscoelasticity**

M. Fabrizio

6:15 pm

Pick up from the Executive House Hotel for the *Conference Banquet at the Pan Pacific*

**Saturday, June 22nd, 2002**

**MINI-SYMPOSIUM  
on Inhomogeneous Plane Waves  
Part II**

Organizer: **Michael Hayes**

Chairs: Michael Hayes/Philippe Boulanger

Room: Images Theatre, Academic Quadrangle

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| 10:40 am – 11:00 am | <b>Reflection and Refraction of the Evanescent Plane Wave</b><br>M. Deschamps   |
| 11:00 am – 11:20 am | <b>Circularly Polarized Inhomogeneous Elastic Waves in Crystals</b><br>P. Boulanger*, M. Hayes  |
| 11:20 am – 11:40 am | <b>Using Inhomogeneous Plane Wave<br/>Concept for Describing Diffraction Effect of Propagating<br/>Waves in Anisotropic Media</b><br>O. Poncelet, M. Deschamps* |

**GREEN MINI-SYMPOSIUM  
Part II**

Organizer: **Patrick Selvadurai**

Chairs: P. Selvadurai/A.J.M. Spencer

Room: Images Theatre, Academic Quadrangle

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|-----------------------|---|
| 11:40 am – 12:00 noon | <b>A General Criterion for Linear Stress–Strain Relations in<br/>Finite Hyperelasticity</b><br>R. Parnes*, A. Chiskis |
| 12:00 noon – 12:20 pm | <b>Ultrafast Nonlinear Optical Phenomena in Semiconductors –<br/>Numerical Analysis and Applications</b><br>V. Van    |
| 12:20 pm – 12:40 pm   | <b>Plane Universal Solutions in a Class of Area–Preserving Solids</b><br>N. Achcar*, R. T. Kulcsar                    |

12:40 pm – 2:10 pm

Lunch

## Saturday, June 22nd, 2002

### MINI-SYMPOSIUM on Shape Memory Alloy Composites

Organizer: **Kamran Behdinan**

Chairs: K. Behdinan / R. Ben Mrad

Room: Images Theatre, Academic Quadrangle

2:10 pm – 2:30 pm

**Correlating Experimental and Modeling Results in Analysing Non-Linear Response for Miniaturized Structures**

H. Lu

2:30 pm – 2:40 pm

**Characterization of Tini Shape Memory Alloy Springs**

Y. Matsunaga\*, M. Taya

2:50 pm – 3:10 pm

**Shape Memory Alloy Composite Actuators: Finite Element Analysis and Experiment**

K. Behdinan\*, A. Khajepour, M.M. Ghomshei

3:10 pm – 3:30 pm

**Optimization of Adaptive Truss Structures Under Dynamic Loading Using the Finite Element Force Method**

R. Sedaghati, A. Suleman\*

4:10 pm – 4:30 pm

**Design Issues in Inchworm Nanopositioners**

P.E. Tenzer, R. Ben Mrad\*

6:15 pm

Pick up from the Executive House Hotel for the *Conference Banquet at the Pan Pacific*

## Saturday, June 22nd, 2002

### SESSION S-3

Chairs: **L.M.Zubov / F. Marotti de Sciarra**

Room: 3003, Academic Quadrangle

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|-----------------------|---|
| 10:40 am – 11:00 am   | <b>On Nonlocal Rate Plasticity</b><br>G. Romano, F. Marotti de Sciarra*, M. Diaco   |
| 11:00 am ñ 11:20 am   | <b>Propagation d'ondes dans un sol homogene generees par une machine vibrante</b><br>B. Sbartai*, A. Boumekik               |
| 11:20 am ñ 12:00 noon | <b>On the Nonlinear Theory of Bending and Torsion of Elastic Bodies With Couple Stress</b><br>L. M. Zubov                   |
| 12:00 noon – 12:20 pm | <b>On the Finite Element Method for the Obstacle Problem for a Nonlinear Shallow Shell</b><br>L. P. Lebedev, A. B. Neymark* |
| 12:20 pm – 12:40 pm   | <b>Stochastic Flutter of Elastic and Viscoelastic Plates in a Supersonic Flow</b><br>V. D. Potapov                          |

6:15 pm

Pick up from the Executive House Hotel for the *Conference Banquet at the Pan Pacific*

***Welcome to Vancouver at CanCNSM 2002!***