

Table of Contents

SESSION M1: NANOTECHNOLOGY I

- Helium Gas Permeability of Carbon Nanotubes Dispersed Epoxy NT1**
T. AOKI, T. OGURA and T. OGASAWARA
- Modeling Compressive Failure of Nanoclay—Enhanced
Fiber Composites NT2**
A. K. SUBRAMANIYAN and C. T. SUN
- Nanotube-Reinforced Composites: Characterization and Modeling . . . NT3**
E. T. THOSTENSON and T.-W. CHOU

SESSION M2: MANUFACTURING AND PROCESSING I

- Composites Materials Reinforced by Flax Fibres Correlation
between Adhesion of Fibre/Matrix and Mechanicals Properties
of Laminates According to Chemicals Treatments of Fibres MP1**
F. BUSNEL, C. BALEY and Y. GROHENS
- Fabrication and Characterization of PLA Fabric Insert Injection
Molded Biodegradable Composites MP3**
U. S. ISHIAKU, Y. W. LEONG, O. A. KHONDKER, A. NAKAI
and H. HAMADA
- Bismaleimide and Cyanate Ester Sequential IPNs for High
Temperature Composite Liquid Molding Applications MP4**
X. GENG and G. R. PALMESE

SESSION M3: NONDESTRUCTIVE EVALUATION

- Ultrasonic Characterization of Bond Line Parameters in Adhesively
Bonded Carbon-Epoxy Composites NE2**
P. MYLAVARAPU, E. WOLDESENBET, N. GUPTA, A. DAVIS,
G. LI and A. HAMILTON
- Self-Diagnosis of Damage in Fibrous Composites using Electrical
Resistivity Measurements NE3**
G. P. TANDON, R. Y. KIM, E. RIPBERGER, C. W. LEE,
M. J. ROEMER and J. GE

**Damage Evolution of a Woven Sandwich Composite by
AE NDE** NE4
E. O. AYORINDE, H. MAHFUZ, S. ISLAM and S. JEELANI

SESSION M4: NUMERICAL METHODS I

**A Unified Approach for Evaluating Stiffness and Ply Stresses of
Composite Beams with Various Cross-Sections** NM1
W. S. CHAN

**Transient Thermoelastic Deformations of Functionally Graded Beams
by the Meshless Local Petrov-Galerkin Method.....** NM2
H.-K. CHING and M. S.-C. YEN

**Higher-Order Finite Element Formulation for Dynamic Analysis of
Laminated Composite Beams** NM3
R. GANESAN and A. ZABIHOLLAH

SESSION M5: COMP DESIGN I

**On the Fundamental Limitations of Data and Models—Lessons
from the Composites World.....** H14
P. A. LAGACE and B. L. WARDLE

Modeling Mechanical Joints in Otherwise Linear Structures H24
D. J. SEGALMAN

**Design of Efficient Bonded Joints for Thin-Walled Composite
Structures** H26
C. T. SUN

SESSION M6: NANOTECHNOLOGY II

**Polymer/Carbon Nanotube Nanocomposite Fibers:
Process-Morphology-Property Relationships** NT4
M. JOSE, J. TYNER and D. DEAN

**Cross-Linked Nanotube Materials with Variable Stiffness
Tethers** NT5
S.-J. V. FRANKLAND, G. M. ODEGARD, M. N. HERZOG,
T. S. GATES and C. C. FAY

**Adhesive Bonding Reinforced by Nanofibers for Materials and
Structural Joints.....** NT17
L. R. XU, L. LI, C. M. LUKEHART, S. SENGUPTA,
H. KUAI and P. WANG

SESSION M7: MANUFACTURING AND PROCESSING II

Development of Bamboo Fiber/Biodegradable Polymer Composites .. MP5

K. KITAGAWA, Y. KIMURA, Y. KORI, H. HAMADA, A. NAKAI,
M. MIZOGUCHI, S. AIBA, H. OKUMURA, T. YOSHIDA,
Y. SHIMODOI, T. NAGAI and A. KIMURA

**Filament Winding: Analytical Kinematic Solutions and
Collision Control MP6**

S. KOUSSIOS and O. K. BERGSMA

**Filament Winding: Process Optimisation through Application of
Dynamic Programming..... MP7**

S. KOUSSIOS and O. K. BERGSMA

SESSION M8: EMBEDDED SENSORS

**Delamination Detection in CFRP Laminates using Fiber Bragg
Grating Sensors as Lamb Wave Receivers ES1**

Y. OKABE, H. TAMAUE, J. KUWAHARA, N. TAKEDA
and S. KOJIMA

**Failure Mechanisms of Cu Embedded Multifunctional Composite
Structures ES2**

M. PARK, K. HSIEH and H. K. KIM

**Measurement of Strain in the Skin and Core Layers of Composite
Laminates using A-EFPI Optical Fiber Sensor ES3**

S.-C. WOO and N.-S. CHOI

SESSION M9: NUMERICAL METHODS II

**A Nonlinear Sublamine Model for the Viscoelastic Analysis of
Multi-Layered FRP Composite Structures NM4**

A. H. MULIANA and R. M. HAJ-ALI

**The Influence of Geometric Nonlinearities on the Deformations of
Inplane-Loaded Flat Semi-Infinite Unsymmetric Laminates NM5**

M. A. MAJEED and M. W. HYER

Predicting Stress-Strain Response in Composite Laminates NM6

J. M. WHITNEY

SESSION M10: COMP DESIGN II

**A Study on the Flexible FR-4 Application for Memory Chip
Packaging H12**

Y. K. KIM

Dynamic Behavior of Advanced Gun Barrels in Response to Launch of a Projectile	H29
J. T. TZENG	

SESSION M11: FRACTURE AND FAILURE I

Failure Mechanisms in Polymer Composites Containing Micro and Nano Particles.....	FF1
J. CHO and C. T. SUN	

Effects of Friction, Geometry and Fixture Compliance on the Perceived Toughness from Three and Four Point Bend End Notched Flexure Tests.....	FF2
B. D. DAVIDSON and X. SUN	

Failure Analysis and Fatigue Life Prediction of a Composite Structural Beam	FF3
M. D. HAYES and J. J. LESKO	

Mode I Fracture Toughness of Advanced Polymers in a Cryotank Environment.....	FF4
M. M. PAVLICK and W. S. JOHNSON	

SESSION M12: HIGH PERFORMANCE COMPOSITES FOR HIGH PERFORMANCE CARS I

Composite Design and Manufacture of the Swift Toyota Atlantic Race Car	HPC4
N. ROBERTS, T. HUSCHILT, D. McLARTY and C. NORRIS	HPC4

Safety and Weight Tradeoffs Achieved using Advanced Composite Materials in Racing Cars.....	HPC4
M. SACCOME	HPC7

SP Systems Sprint Technology for the MG X-Power SV	HPC4
R. PALMER and J. SUMMERS	HPC6

Advanced Composites on the Ford GT	HPC4
D. HOUSTON, E. KLEVEN and J. T. LYONS	HPC5

SESSION M13: MICROMECHANICS I

Micro to Macro Structural Mechanics	MM1
C. C. CHAMIS	

Asymptotic Homogenization Model for Prediction of Effective Properties of Composite and Heterogeneous Structures MM2
Z. FANG, W. SUN and J. T. TZENG

Thermo-Viscoplastic Modeling of Composites Exposed to Fire or High Temperature MM5
S. W. KWON, W. SMITH and S. W. LEE

SESSION M14: MODELING I

Buckling of Thin-Walled Composite Beam-Columns with Stochastic Properties MD2
R. GANESAN and V. K. KOWDA

The Effect of Non-Classical Behaviors on the Measurement of the Timoshenko Shear Stiffness MD3
M. D. HAYES and J. J. LESKO

Nonlinear Constitutive Modeling of FRP Composites using Artificial Neural Networks MD4
R. M. HAJ-ALI and H. K. KIM

Validation of a Woven Fabric Analyzer using Composite Material Strain Measurements from a Digital Image Correlation System MD5
J. LUA, C. KEY, J. O'BRIEN, R. A. LOPEZ-ANIDO, F. W. EL-CHITI, H. DAGHER and P. HESS

SESSION M15: ENERGY ABSORPTION AND BALLISTIC PROTECTION

Analytical/Experimental Investigation of Energy Absorption in Grid-Stiffened Composite Structures under Transverse Loading H6
C. GAN, R. F. GIBSON and G. M. NEWAZ

Penetration Failure of Composite Structures: (II) Armor-Grade Composites and Hybrid Systems H25
J. SONG, H. PATTS, T. RUDE and B. L. LEE

Structural Performance of Laminated Armors for the Army's Future Combat Systems H7
C. P. R. HOPPEL, T. A. BOGETTI, S. WOLF, A. YIOURNAS, C. KRAUTHAUSER and J. W. GILLESPIE, JR.

SESSION M16: FRACTURE AND FAILURE II

Interlaminar Fracture Toughness and Thickness Effects of IM7/977-2 Composites in a Cryotank Environment FF5
M. M. PAVLICK, M. S. OLIVER and W. S. JOHNSON

**Characterization of the Edge Crack Torsion (ECT) Test for
Mode III Fracture Toughness Measurement of
Laminated Composites.....FF6**
J. G. RATCLIFFE

**Discrete Spring Model for Predicting Delamination Growth in
Z-Fiber Reinforced DCB SpecimensFF7**
J. G. RATCLIFFE and T. K. O'BRIEN

**Damage and Delamination Characteristics in Composite
Laminates with Ply Dropoffs under Static and
Cyclic In-Plane Loads.....FF8**
D.-J. SHIM and P. A. LAGACE

SESSION M17: HIGH PERFORMANCE COMPOSITES FOR HIGH PERFORMANCE CARS II

**Moving Closer to the Goal of Cost Effective Complex Geometry
Carbon Composite PartsHPC4HPC2**
J. H. PORTER

The Design of a Funny Car Dragster Body ShellHPC4HPC3
N. ROBERTS, D. McLARTY, C. NORRIS and T. HUSCHILT

**Development of Carbon/Epoxy Structural Components for a
Topless High Performance VehicleHPC4HPC1**
A. MASINI, L. TARABORRELLI, A. PIVETTI and P. J. FERABOLI

**Design and Manufacturing Advanced Automotive
Composite StructuresHPC4HPC8**
G. HALSTEAD

SESSION M18: IMPACT AND ENERGY ABSORPTION I

**Analytical and Experimental Investigations of the Impact Response
of Grid Stiffened E-Glass/Polypropylene (PP) Composite PanelsIE2**
P. JADHAV, P. R. MANTENA and R. F. GIBSON

Impact Resistance of Three-Dimensional Woven Fabric Composites ... IE4
D. LIU, G. COPPENS, B. RAJU and D. TEMPLETON

**Hygrothermal Testing and Evaluation of Mechanical Properties of
Rubber-Glass Particulate Hybrid CompositesIE5**
R. MAHARSIA, N. GUPTA and H. D. JERRO

**Detecting the Perforation Threshold of Curved Symmetrical CFRP
Composite PanelsIE8**
O. S. DAVID-WEST, D. H. NASH and W. M. BANKS

SESSION M19: ENVIRONMENTAL AND TRANSPORT PROPERTIES

- Damage Initiation and Growth in Composite Laminates under Thermomechanical Loadings.....H11**
R. Y. KIM, S. L. DONALDSON and V. BECHEL
- Effect of Environment and Sustained Load on Fracture Toughness of GFRP-Concrete BondH36**
J. JIA, T. E. BOOTHBY, C. E. BAKIS and T. BROWN
- CTE Measurements and Residual Stresses at Cryogenic and High TemperaturesH19**
O. O. OCHOA, R. KULKARNI and Z. LUO
- Use of Percolation Concepts in Materials Design, and Design of Intracellular Sensor Arrays.....H23**
Y. B. YI, M. V. INAMDAR, C. W. WANG and A. M. SASTRY

SESSION T1: TEST METHODS I

- An Experimental Investigation of the Effect of a Negative Through-the-Thickness Poisson's Ratio on Patch Repairs..... TM1**
A. F. AVILA and E. MADENCI
- A New Test Method in Determining the Mohr-Coulomb Friction Factor and Transverse Shear Strength of Thick-Section CompositesTM2**
C. E. CICHANOWSKI, J. XIAO, B. A. GAMA and J. W. GILLESPIE, JR.
- Tensile Scaling Effects in Notched Composites TM3**
B. G. GREEN, M. R. WISNOM and S. R. HALLETT

SESSION T2: FRACTURE AND FAILURE III/NANOTECHNOLOGY III

- Modeling of the Compressive Failure of Plain Weave Composites FF9**
C.-F. YEN, B. A. CHEESEMAN, C. P. R. HOPPEL, B. A. GAMA and J. W. GILLESPIE, JR.
- A Three Dimensional Stress Transfer Model of Single Walled Carbon Nanotube Reinforced Composites.....NT21**
A. RAMASETTY and A. HAQUE
- Evaluation of Thermal and Mechanical Properties of Nanophased Carbon PrepregsNT22**
M. A. BASEER, H. MAHFUZ, V. K. RANGARI, Y. ZHOU and S. JEELANI

SESSION T3: MICROMECHANICS II

- A Parametric Study of Commingled Glass/Polypropylene Woven Fabrics during Shear.....MM6**
L. LIU, J. CHEN and J. A. SHERWOOD
- Mechanical Properties of Matrix Blend Composites.....MM7**
K. SUGIMOTO, N. KAWAI, A. OCHI, S. BABA, T. NARITA, Y. FUJII,
M. MIZOGUCHI, T. MORII, A. NAKAI and H. HAMADA

SESSION T4: IMPACT AND ENERGY ABSORPTION II

- A Multi-Parameter Approach to Impact Performance Characterization**IE1
P. J. FERABOLI and K. T. KEDWARD
- Dynamic Axial Crush of Automotive Rail-Sized Composite Tubes Part 4: Plug vs. Non-Plug Crush Initiators**IE9
A. L. BROWNE and M. E. BOTKIN

SESSION T5: COMP DESIGN III/PROCESSING I

- Bending Performance of Low-Cost Sandwich Panels: Predictions and Measurements**H8
M. W. HYER and C. E. GLENN
- Effect of Sandwich Design on Effective Properties of Honeycomb Core**H30
J. WHITCOMB and J. SUE
- Development of Residual Stresses and Distortion during the Cure of Polymer Matrix Composites**H32
M. R. WISNOM

SESSION T6: TEST METHODS II

- Interlaminar Strain Measurement for the Determination of TiGr Residual Stresses in Ti-15-3.....TM4**
D. RHYMER, S. JOHNSON and E. LI
- Development and Characterization of ECLIPSE Actuators**TM5
K. G. WEBBER and C. S. LYNCH
- Edge Modifications for Fiber Pushout Experiments.....TM6**
L. R. XU, H. KUAI and S. SENGUPTA

SESSION T7: NANOTECHNOLOGY IV

- Carbon Nanofiber Modified Carbon-Carbon Composites**NT16
U. K. VAIDYA, R. JAIN and A. HAQUE

Analytical Modeling of Fracture Behavior in Carbon Nanofiber Reinforced Polymer Composite through Crack-Nanofiber Interaction Problem NT7
A. GAWANDI, J. M. WHITNEY and R. A. BROCKMAN

Studies on the Microwave Curing and Characterization of SC-15 Epoxy Reinforced with ZnO Nanoparticles NT9
M. V. HOSUR, M. K. JOHN, V. K. RANGARI and S. JEELANI

SESSION T8: SANDWICH COMPOSITES/TEXTILE COMPOSITES

Effect of Explosions on Sandwich Structures SC1
S. ABRATE

Thermostamping of Woven Commingled Glass-Polypropylene Composite Fabrics: FEA with User-Defined Subroutines in ABAQUS TC1
J. GORCZYCA, J. A. SHERWOOD and J. CHEN

Hybrid Finite Element Model of Woven-Fabric Composites TC2
X. LI, J. A. SHERWOOD, L. LIU and J. CHEN

SESSION T9: INFRASTRUCTURE COMPOSITES

Effect of Variability of Composite Properties on Wet Layup Based Rehabilitation of Concrete Structures IC1
R. A. ATADERO, L. S. LEE and V. M. KARBHARI

Use of Thermography as a NDE Tool for Detecting Damage in FRP Rehabilitated Concrete Structures IC2
K. K. GHOSH and V. M. KARBHARI

Hybrid Fiber Reinforced Polymer (FRP)—Autoclave Aerated Concrete (AAC) IC3
J. C. SERRANO-PEREZ, A. KHOTPAL, U. K. VAIDYA and N. UDDIN

SESSION T10: COMP PROCESSING II

Intelligent Processing of Composites H3
I. M. DANIEL, S.-K. KIM and J. G. OPPERER

SESSION T11: TESTING METHODS III

Effect of Thickness of Platelet on Load Transfer Efficiency in Platelet-Reinforced Composites TM7
A. DEO and C. T. SUN

Metal Matrix Composite Compressive Stress-Strain Response: Correlation of Theoretical Predictions with Experimental Measurements	TM8
Z. XI, T. A. BOGETTI, A. PAESANO, A. YIOURNAS, I. W. HALL, W. H. DRYSDALE and J. W. GILLESPIE, JR.	
Follow Up of Damage Development by Full Field Optical Methods . . .	TM9
A. H. CARDON, P. BOUQUET, D. VAN HEMELRIJCK and A. SMITS	
In Search of the True Interlaminar Shear Strength	MD1
P. J. FERABOLI and K. T. KEDWARD	
 SESSION T12: NANOTECHNOLOGY V	
Processing and Creep of Carbon Nanofiber and Nanotube Reinforced Epoxy Composites	NT12
R. T. PASZKOWSKI and C. E. BAKIS	
Thermoset Polymer Nanocomposites: The Effect of Nanoparticles on Chemorheology, Morphology and Properties	NT13
D. DEAN, R. WALKER, M. THEODORE and E. NYAIRO	
Effect of Nano-Reinforcement on Dynamic Mechanical Behaviors of Nylon 6/Clay Nanocomposites.	NT15
J.-L. TSAI and J. C. HUANG	
Buckling Stability of Carbon Nanotube/Polymer Orthotropic Plates	NT6
T. S. GATES, G. M. ODEGARD, M. P. NEMETH and S.-J. V. FRANKLAND	
 SESSION T13: MANUFACTURING AND PROCESSING III	
Design of Improved Electron Beam Cured Epoxy Systems	MP8
J. LEE and G. R. PALMESE	
Mechanical Properties of Multi-Axial Warp Knitted Thermoplastic Composites.	MP10
A. NAKAI, T. NARITA, H. HAMADA, I. KOMIYA and E. FUKUI	
Toughening Vinyl Ester Matrix Composites using Electrospun Polysulfone Mats as an Interlaminar Layer	MP11
E. J. ROBINETTE and G. R. PALMESE	
Tool-Part Interaction Mechanisms Causing Residual Stresses and Distortion During Cure of Polymer Matrix Composites.	MP12
M. R. WISNOM, M. CAMPBELL, N. ERSOY, T. GARSTKA, C. LANGER and K. D. POTTER	

SESSION T14: NUMERICAL METHODS III

Numerical Estimates of the Compressive Strength of Impact-Damaged Sandwich Composites.....NM7
Y. HWANG and T. E. LACY

Linear Modeling of Aeroelastic Twist of a High Aspect Ratio Composite Wing with Significant TaperNM8
B. SIKOLA and L. W. REHFIELD

Optimum Stacking Sequences for Extension-Twist Coupled Strips under Mechanical LoadingNM9
S. OZBAY, S. TAWFIK, X. TAN and E. ARMANIOS

SESSION T15: NOVEL MATERIALS AND APPLICATIONS I

Damage Tolerance and Durability of Fiber-Metal Laminates for Aircraft StructuresH33
G. WU, J.-M. YANG and H. T. HAHN

Shape Memory Effect in Smectic-C Liquid Crystalline Elastomers.... H35
P. T. MATHER and I. A. ROUSSEAU

SESSION T16: AGING AND LONG-TERM DURABILITY

Investigation of Synergistic Hygrothermal and Sustained Strain Effects on the Durability of Pultruded E-Glass/Vinyl-Ester Composites AL1
C. S. HELBLING and V. M. KARBHARI

Infrared Thermography for Fatigue Damage Detection in FRP Composites.....AL2
S. JOHNSON and R. M. HAJ-ALI

Reliability of Lifetime Prediction for Composite Materials under Variable Amplitude Loading.....AL3
O. KRAUSE

Probabilistic Fatigue Damage Modeling of Composite Laminates.... AL4
Y. LIU and S. MAHADEVAN

SESSION T17: NANOTECHNOLOGY VI

Processing of Graphite Nanosheet Reinforced Polymer NanocompositesNT18
A. YASMIN, J.-J. LUO and I. M. DANIEL

Polymer/Carbon Nanotube Composites: Challenges and OpportunitiesNT19
H. G. CHAE, X. ZHANG, B. MIN, T. LIU, T. V. SREEKUMAR,
T. UCHIDA and S. KUMAR

Magnetic Composites for Surface Applications	NT20
S.-H. KIM and H. T. HAHN	

SESSION T18: MODELING II

Nonlinear Analysis for Bonded Patch Repair and Damage Monitoring.	MD6
M. NISHINO and T. AOKI	
Evaluation of a Gamma Titanium Aluminide as a Potential Matrix Material for High Temperature Applications	MD7
C. E. WEEKS, J. S. CRAFT and W. S. JOHNSON	
Analysis of the Staggered Beam Isopescu Shear Test	MD8
J. M. WHITNEY and A. GAWANDI	

SESSION T19: STRENGTH ANALYSIS

Three-Dimensional Stress Analysis and Weibull Statistics Based Strength Prediction in Open Hole Composite Laminates	H9
E. V. IARVE, R. KIM and D. MOLLENHAUER	
Fiber Strength Modeling for Continuous Fiber Composites	H10
E. M. WU and J. L. KARDOS	
Development of a Failure Criteria for Transversely Loaded Unidirectional Composites.	H27
D. C. FOSTER and G. P. TANDON	

SESSION T20: NOVEL MATERIALS AND APPLICATIONS II

Structure Property Relations of Ultra-High Temperature Polymers and their Composites	H18
R. J. MORGAN, D. Y. LI, F. TSCHEN and C. TAPP	
Ribbon-Like and Plate-Like Molecules as Reinforcements for Polymer Matrices	H20
L. S. PENN, J. C. MAILLOT, J. ANTHONY, M. M. PAYNE, F. B. MALLORY, K. LIU, R. A. MILLER and B. D. SWISS	
Lithium-Ion Cells as Multifunctional Structure-Energy Composites	H28
J. P. THOMAS, P. MATIC, M. A. QIDWAI and J. N. BAUCOM	

SESSION W1: TESTING METHODS III

Application of Luminescent Photoelastic Coating for Composite Materials	TM10
L. CHEN, P. IFJU, P. HUBNER and J. NICOLOSI	

An Apparatus for Shear Strength and Fully-Reversed Shear Fatigue of Composites and Sandwich Materials TM12
L. LIU, J. W. HOLMES and G. KARDOMATEAS

SESSION W2: NANOTECHNOLOGY VII/EDUCATION

Structure and Properties of Aligned Carbon Nanotubes Reinforced Nanocomposite Fibrils NT10
H. LAM, N. TITCHENAL, H. YE, Y. GOGOTSI and F. K. KO

Composite Skateboard Design and Construction Experience for Freshmen Engineering Students ED1
U. K. VAIDYA, G. M. JANOWSKI, J. B. ANDREWS, Z. DWYER and D. RIGNEY

SESSION W3: JOINING

Mechanical Behavior of Multi-Axial Warp Knitted Fabric Composites with Bolted Joint JO2
A. OCHI, K. SUGIMOTO, A. NAKAI and H. HAMADA

Mechanical Fasteners for Thermoplastic Composite/Steel Bolted Joints Subjected to Peel Loads JO3
L. G. SMITH, I. MISKIOGLU, J. B. LIGON and R. L. WHIPPLE

SESSION W4: BIOCOMPOSITES

Biodegradable Sweet Potato Starch/Polyethylene Blends and Nanocomposites BC1
D. DEAN, D'.J. PATTERSON, A. BENJAMIN and E. NYAIRO

Fatty Acid-Based Monomers for Styrene Reduction in Liquid Molding Resins BC2
J. J. LA SCALA, J. M. SANDS and G. R. PALMESE

SESSION W5: NANOSCALE MATERIALS

Atomistic Modeling for Static, Dynamic and Thermal Properties of Carbon Nanotubes H2
C. LI and T.-W. CHOU

Graphite Nanoplatelets: A Multifunctional Reinforcement for Polymers Mechanical, Thermal and Electrical Properties H5
L. T. DRZAL and H. FUKUSHIMA

Nanocapsules for Self-Healing Composites.....	H17
S. R. WHITE, N. R. SOTTOS, N. BOSSCHER, B. BLAISZIK and A. RZESZUTKO	
Carbon Nanotube Reinforced Spider Silk—A Model for the Next Generation of Super Strong and Tough Fibers.....	H13
F. K. KO, M. GANDHI and C. KARATZAS	