

Concurrent Technical Symposia Schedule

Tuesday Morning - April 10, 2018 | 10:30 a.m. - 12:00 p.m.

Presentations are noted by corresponding paper number to the Abstracts

*Denotes Presentation Only

SYMPOSIUM 1: Granular Materials in Space Exploration

Chester

10:30 a.m. - 12:00 p.m.

Extraterrestrial Simulants

Session Chair: Andreas Becker
(Technical University Kaiserslautern, Germany)

- 111*** - UCF/DSI Asteroid Regolith Simulants
Daniel Britt (University of Central Florida, USA)
- 112** - Assessment of Lunar Soil Simulants
Based on Multivariate Statistics
Jacek Katzer (Koszalin University of
Technology, Poland)
- 113*** - Phobos Simulants for MMX Mission
Daniel Britt (University of Central Florida, USA)
- 114** - Developing Carbonaceous Chondrite
Asteroid Simulants
Stephen Covey (Deep Space Industries, USA)

SYMPOSIUM 2: Exploration and Utilization of Extra-Terrestrial Bodies

Prospect

10:30 a.m. - 12:00 p.m.

Robotic Mobility in Extreme Terrain

Session Chairs: Colin Creager and Kyle Johnson
(NASA Glenn Research Center, USA)

- 211*** - Optimization of the Non-pneumatic
Spring Tire for Traction in Soft Soil
Colin Creager (NASA Glenn Research Center, USA)
- 212** - Cryogenic Vacuum Testing of
Lunar Rover Drivetrain
Perry Edmundson (Canadensys Aerospace Corporation,
Canada)
- 213** - Traversing Tight Tunnels – Implementing
an Adaptive Concertina Gait in a
Biomimetic Snake Robot
Henry C. Astley (University of Akron, USA)
- 214*** - NASA 8th Annual Robotic Mining
Competition for Universities: Lessons
Learned, Robot Configurations and Results
Robert P. Mueller (NASA Kennedy Space Center, USA)

SYMPOSIUM 3: Advanced Materials and Designs for Aerospace Structures and Terrestrial Structures under Extreme Environments

St. Clair

10:30 a.m. - 12:00 p.m.

Advanced and Alternative Cementitious Materials I

Session Chair: Christopher Ferraro (University of Florida, USA)

- 321** - Extruded Clay-Based Regoliths for
Construction on Mars, Phobos, and NEAs
Stephen Covey (Deep Space Industries, USA)
- 322** - Multiscale Modeling and Testing of
Protein-bound Regolith and Soils
I. Rosa (Stanford University, USA)
- 323** - Biocementation of Martian Regolith Simulant
with In-Situ Resources
J. Gleaton (Clemson University, USA)
- 324** - Thermal and Mechanical Properties of
Cementitious Composites for Additive
Construction of Energy-saving Habitats
Hongyu Zhou (University of Alabama in Huntsville, USA)

SYMPOSIUM 3: Advanced Materials and Designs for Aerospace Structures and Terrestrial Structures under Extreme Environments

Carnegie

10:30 a.m. - 12:00 p.m.

General (Composites)

Session Chair: Steve Murphy (The Boeing Company, USA)

- 311*** - Advanced Composites in the Aerospace Industry
Steve Murphy (The Boeing Company, USA)
- 312** - Multiscale Modeling of PEEK using Reactive
Molecular Dynamics and Micromechanics
W.A. Pisani (Michigan Technological University, USA)
- 313** - Predicting the Effective Mechanical Properties
of Graphene Nanoplatelet-Carbon Fiber-Epoxy Hybrid
Composites Using ReaxFF: A Multiscale Modeling
H. Al Mahmud (Michigan Technological University, USA)

SYMPOSIUM 4: Structures in Challenging Environments: Dynamics, Controls, Smart Structures, Health Monitoring, and Sensors

Huron

10:30 a.m. - 12:00 p.m.

Tensegrity-Concept and Applications I

Session Chairs: Ramesh B. Malla (University of Connecticut, USA);
Landolf Rhode-Barbarigos (University of Miami, USA)

- 411** - Dynamics of Class 1 Tensegrity Systems
Including Cable Mass
Raman Goyal (Texas A&M University, USA)
- 412** - Symmetric Reduction of Tensegrity Rover
Dynamics for Efficient Data-Driven Control
David Surovik (Rutgers University, USA)
- 413** - Design of Lightweight Deployable Antennas
using the Tensegrity Principle
Sudarshan Krishnan (University of Illinois at Urbana-Champaign,
USA)
- 414** - Towards a Form-Finding Process for Damage-
Tolerant Tensegrity Structures
O. Aloui (University of Miami, USA)

Concurrent Technical Symposia Schedule

Tuesday Afternoon - April 10, 2018 | 1:30 p.m. - 3:00 p.m.

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SYMPOSIUM 1: Granular Materials in Space Exploration

Chester

1:30 p.m. - 3:00 p.m.

Granular Flows

Session Chair: Philip Metzger (University of Central Florida, USA)

- 121 - Granular Flow and Heat Transfer Modeling for the Helium Extraction and Acquisition Testbed**
A.D.S. Olson (University of Wisconsin-Madison, USA)
- 123 - Gas-Granular Simulation Framework for Spacecraft Landing Plume-Surface Interaction and Debris Transport Analysis**
Peter A. Liever (CFD Research Corporation, USA)
- 124 - Microgravity Granular Material Research Facility for ISS**
J. Sercel (Trans Astronautica Corporation, USA)
- 122 - Discrete Element Modeling of Martian Regolith Simulants Accounting for Realistic Particle Shapes and Particle Size Distributions**
Q. Chen (Clemson University, USA)

SYMPOSIUM 2: Exploration and Utilization of Extra-Terrestrial Bodies

Prospect

1:30 p.m. - 3:00 p.m.

Space Engineering and Construction: Habitats

Session Chairs: Ramesh B. Malla (University of Connecticut, USA); Melissa Sampson (United Launch Alliance, USA)

- 221 - Multiobjective Optimization for Structural Design of Lunar Habitats** Valentina Sumini (Massachusetts Institute of Technology, USA)
- 222 - Mars Surface and Transit Habitat Commonality: Design Considerations**
Olga Bannova (University of Houston, USA)
- 223 - Additive Construction with Mobile Emplacement (ACME) / Automated Construction of Expeditionary Structures (ACES) Materials Delivery System (MDS)**
I. I. Townsend (NASA Kennedy Space Center, USA)
- 224* - Additive Manufacturing with Regolith and Solar Radiation** Matthias Sperl (Institut für Material Physik in Waltraum, Germany)
- 225 - Developing a Request for Proposal (RFP) for Moon Base Alpha**
P. Carrato (Ellis Global LLC, USA)

SYMPOSIUM 3: Advanced Materials and Designs for Aerospace Structures and Terrestrial Structures under Extreme Environments

St. Clair

1:30 p.m. - 3:00 p.m.

Advanced and Alternative Cementitious Materials II

Session Chair: Christopher Ferraro (University of Florida, USA)

- 326 - Creation and Characterization of Regolith-Based Functional Blocks with Simulated In-Situ Martian Materials**
Q. Chen (Clemson University, USA)
- 325 - Scaling Impact Crater Dimensions to Predict Micrometeorite Damage of Biopolymer-Stabilized Regolith**
Maria I. Allende (Stanford University, USA)
- 327 - Performance of A Magnesia Silica Cement for Martian Construction**
Allan Scott (University of Canterbury, New Zealand)

SYMPOSIUM 4: Structures in Challenging Environments: Dynamics, Controls, Smart Structures, Health Monitoring, and Sensors

Huron

1:30 p.m. - 3:00 p.m.

Recent Advances in Dynamics and Control

Session Chairs: Gangbing Song (University of Houston, USA); John Koppelman (The Boeing Company (retired), USA)

- 421 - Aerodynamic Modeling Process Using Reverse Engineering and Computational Fluid Dynamics**
L. Kiskowskiak (Military University of Technology, Poland)
- 423 - Multi-Rate Data Fusion Based Kalman Filtering with Unknown Input for On-line Estimation of Dynamic Displacements**
Ying Lei (Xiamen University, China)
- 424 - Intelligent Traffic Light Control System at Two Intersections using Adaptive Neuro-Fuzzy Inference System (ANFIS) Method**
Rizky Aryo Bayu Utomo (Institut Teknologi Bandung, Indonesia)
- 450 - Dispersion Characteristics of Piezoelectric Guided Waves in Concrete Filled Steel Tubular Columns**
S. Yan (Shenyang Jianzhu University, China)

Concurrent Technical Symposia Schedule

Tuesday Afternoon - April 10, 2018 | 3:30 p.m. - 5:30 p.m.

Presentations are noted by corresponding paper number to the Abstracts

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SYMPOSIUM 1: Granular Materials in Space Exploration

Chester

3:30 p.m. – 5:30 p.m.

Geotechnical Properties and Measurements

Session Chairs: Juan Agui (NASA Glenn Research Center, USA); Purushotham Tukkaraja (South Dakota School of Mines and Technology, USA)

- 131 - Influence of Ice on Velocity of Waves in Regolith** Xiangwu Zeng (Case Western Reserve University, USA)
- 132 - Combined Seismic and Penetration Tests on the Planetary Analogue Site Mount Etna** S.Papamichael (Technical University Kaiserslautern, Germany)
- 133 - Experiments Indicate Regolith is Looser in the Lunar Polar Regions than at the Lunar Landing Sites** P. T. Metzger (University of Central Florida, USA)
- 134* - Cohesion Strength and Bearing Capacity of Regolith in Microgravity** Anton V. Kulchitsky (University of Alaska Fairbanks, USA)
- 135 - The Stinger: A Geotechnical Sensing Package for Robotic Scouting on a Small Planetary Rover** K. Zacny (Honeybee Robotics, USA)
- 136 - High Impact Wave Propagation Studies in Lunar Granular Systems** J. H. Agui (NASA Glenn Research Center, USA)

SYMPOSIUM 2: Exploration and Utilization of Extra-Terrestrial Bodies

Prospect

3:30 p.m. – 5:30 p.m.

Space Engineering and Construction-General

Session Chairs: Olga Bannova (University of Houston, USA); Valentina Sumini (Massachusetts Institute of Technology, USA and Politecnico di Milano, Italy)

- 231 - Zero Launch Mass Three Dimensional Print Head** Nathan J. Gelino (NASA Kennedy Space Center, USA)
- 232 - The Critical and Necessary Role Of Near Solar System Development in Rapidly Modernizing U.S. Physical Infrastructure and Productive Capacity** John C. Smith, Jr. (Naval Facilities Engineering Command, Europe, Africa and Southwest Asia)
- 233 - Lunar Tunnel Boring Machines** Christopher Dreyer (Colorado School of Mines, USA)
- 234 - Affordable Design for Space-Based Biological Laboratories for Alternative Gravity Levels** Thomas L. Matula (Sul Ross State University, USA)
- 235 - Case for a Long Term Logistical Support Base on Phobos** Thomas. J. R. Lagarde (University of Houston, USA)
- 236 - The Need for Remote Artificial Intelligence Control of Space-Based Construction Projects: Multi-Agent-Based Last Planners, Local Centralized Controllers, and Hybrid Solutions to Decision-Making** Hashem Izadi Moud (University of Florida, USA)

SYMPOSIUM 3: Advanced Materials and Designs for Aerospace Structures and Terrestrial Structures under Extreme Environments

St. Clair

3:30 p.m. – 5:30 p.m.

Ballistic Impact and Crashworthiness of Aerospace Structures I

Session Chair: Justin D. Littell (NASA Langley Research Center, USA)

- 332 - Numerical and Experimental Study on Deformation and Failure of Trees under High-Velocity Impact Loads** Chao Zhang (Northwestern Polytechnical University, China); Wieslaw Binienda (The University of Akron, USA)
- 333 - Mesomechanical Simulation of Rate-Dependent Mechanical Behavior for Triaxially Braided Composites** Chao Zhang (Northwestern Polytechnical University, China); Jun Xing (Northwestern Polytechnical University, China & Civil Aviation Administration of China, China)
- 334 - Multiscale Hybrid Element Modeling of Triaxial Braided Composite** Mingkun Sun (The University of Akron, USA)
- 335 - Simulations of Trajectory of Separated Objects after Impact** Menglong Ding (The University of Akron, USA)
- 336 - Development and Verification of an Orthotropic Three-Dimensional Model with Tabulated Input Suitable for Use in Composite Impact Problems** Robert K. Goldberg (NASA Glenn Research Center, USA)

SYMPOSIUM 4: Structures in Challenging Environments: Dynamics, Controls, Smart Structures, Health Monitoring, and Sensors

Huron

3:30 p.m. - 5:30 p.m.

Structures Under Wind/Wave Hazards: Theory and Applications

Session Chairs: Wei Zhang (University of Connecticut, USA); Min Liu (Harbin Institute of Technology, China)

- 431 - Assessment of Wave Energy Dissipation and Stability of Breakwater with Varied Geometries Subjected to Strong Waves** Xuan Li (University of Connecticut, USA)
- 433 - Evaluation of Vehicle Performance on Slender Coastal Bridges Considering Wind and Wave Actions** W. Zhang (University of Connecticut, USA)
- 434 - Response of Short Span Continuous Girder Bridge Under Spatially Varying Multi-point Earthquake Waves Excitation** Shuli Fan (Dalian University of Technology, China)
- 435 - Vibration Control of High-Rise Building Installed with Viscoelastic-wall Damper Subjected to Wind Excitation** M. Liu (Harbin Institute of Technology, China)

Concurrent Technical Symposia Schedule

Wednesday Morning - April 11, 2018 | 10:30 a.m. - 12:00 p.m.

Presentations are noted by corresponding paper number to the Abstracts

**Denotes Presentation Only*

SYMPOSIUM 1: Granular Materials in Space Exploration

Chester

10:30 a.m. - 12:00 p.m.

Mechanic Strength of Space Materials

Session Chair: Jim Mantovani (NASA Kennedy Space Center)

141 - Mechanical Properties of Icy Lunar Regolith: Application to ISRU on the Moon and Mars
J Atkinson (Honeybee Robotics, USA)

142 - Thermal Cycling and the Strength of Primitive Asteroids
Daniel Britt (University of Central Florida, USA)

143 - Measurements of Adhesion in CM2 Meteorites and Associated Minerals for Applications to Small C-type Asteroids
R. Harvey (Case Western Reserve University, USA)

145* - Characterization of Hawaiian Basalt Aggregate for Lunar/Mars Simulant Utilization and Structural Properties of Sintered Basalt
Kyla Defore (Pacific International Space Center for Exploration Systems, USA)

SYMPOSIUM 2: Exploration and Utilization of Extra-Terrestrial Bodies

Prospect

10:30 a.m. - 12:00 p.m.

Space Engineering and Construction-Landing Pads

Session Chairs: Gerald Sanders (NASA Johnson Space Center, USA); Christopher Dreyer (Colorado School of Mines, USA)

241 - Robotic Mars and Lunar Landing Pad Construction Using In-Situ Rocks
Paul J. van Susante (Michigan Technological University, USA)

242 - Combustion Joining of Regolith Tiles for In-Situ Fabrication of Launch/Landing Pads on the Moon and Mars
Robert E. Ferguson (The University of Texas at El Paso, USA)

244 - Planetary Lego: Designing a Construction Block from a Regolith Derived Feedstock for In-Situ Robotic Manufacturing
Rodrigo Romo (Pacific International Space Center for Exploration Systems, USA)

SYMPOSIUM 3: Advanced Materials and Designs for Aerospace Structures and Terrestrial Structures under Extreme Environments

St. Clair

10:30 a.m. - 12:00 p.m.

Ballistic Impact and Crashworthiness of Aerospace Structures II

Session Chair: Justin D. Littell (NASA Langley Research Center, USA)

337 - Vertical Drop Test and Simulation of a Fokker F-28 Fuselage Section
Justin Littell (NASA Langley Research Center, USA)

338 - Full-Scale Drop Test of a Fokker F28 Wingbox Fuselage Section
J. D. Littell (NASA Langley Research Center, USA)

340 - Modeling and Simulation for Occupant Safety in Aerospace Applications
Joseph A. Pelletiere (Federal Aviation Administration, USA)

339 - Crashworthiness by Analysis: Verifying FEA Modeling Capabilities by Accident Reconstruction
Chandresh Zinzuwadia (Wichita State University, USA)

SYMPOSIUM 4: Structures in Challenging Environments: Dynamics, Controls, Smart Structures, Health Monitoring, and Sensors

Huron

10:30 a.m. - 12:00 p.m.

Specialized Sensors-based Structural Damage Detection and Health Monitoring I

Session Chairs: Sudarshan Krishnan (University of Illinois/ Urbana-Champaign, USA); Baoxin Qi (Shenyang Jianzhu University, China)

441 - Determination of Natural Frequencies of a Steel Railroad Bridge Using Onboard Sensors
Suvash Dhakal (University of Connecticut, USA)

442 - Stress Monitoring of the Spatial Truss of the Huanghe Center Stadium During Construction
L. Ren (Dalian University of Technology, China)

443 - Seismic Health Monitoring of a Space RC Frame Structure Using Piezoceramic-Based Sensors
Wen-I Liao (National Taipei University of Technology, Taiwan)

444 - Detection of High-strength Bolts Looseness Using Lead Zirconate Titanate due to Wavelet Packet Analysis
Gangbing Song (University of Houston, USA)

Concurrent Technical Symposia Schedule

Wednesday Afternoon - April 11, 2018 | 2:00 p.m. - 3:30 p.m.

Presentations are noted by corresponding paper number to the Abstracts

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SYMPOSIUM 2: Exploration and Utilization of Extra-Terrestrial Bodies

Chester

2:00 p.m. - 3:30 p.m.

ISRU-Volatile Extraction

Session Chairs: Julie Kleinhenz (NASA Glenn Research Center, USA);
Philip Metzger (University of Central Florida, USA)

272 - Testing of the Planetary Volatiles Extractor (PVEx)

V. Vendiola, K. Zacny (Honeybee Robotics, USA)

271 - Volatiles Loss from Water Bearing Regolith Simulant at Lunar Environments

Julie Kleinhenz (NASA Glenn Research Center, USA)

273 - Modeling the Thermal Extraction of Water Ice from Regolith

P. T. Metzger (University of Central Florida, USA)

274 - Extraction of Water from Martian Regolith Simulant via Open Reactor Concept

Andrew J. Trunek (NASA Glenn Research
Center, USA)

SYMPOSIUM 2: Exploration and Utilization of Extra-Terrestrial Bodies

Prospect

2:00 p.m. - 3:30 p.m.

Extraterrestrial Drilling I

Session Chairs: Brian Glass (NASA Ames Research Center, USA);
Arwen Dave (NASA Ames Research Center, USA)

251 - UPCD: Field Trial Results and Further Work

Ryan Timoney (University of Glasgow, United Kingdom)

254 - Preliminary Experiments on Soil Flow Characteristics of Flexible Tube Coring for Lunar Exploration

Junyue Tang (Harbin Institute of Technology,
P.R. China & Northwestern University, USA);
Qiquan Quan, Shengyuan Jiang (Harbin Institute
of Technology, China)

257 - Ultrasonically Assisted Hammer-Action Penetrators in Planetary Regolith

David Firstbrook (University of Glasgow, UK)

252 - Auto-Gopher-2 – An Autonomous Wireline Rotary Piezo-Percussive Deep Drilling Mechanism

Kris Zacny (Honeybee Robotics, USA)

SYMPOSIUM 3: Advanced Materials and Designs for Aerospace Structures and Terrestrial Structures under Extreme Environments

St. Clair

2:00 p.m. - 3:30 p.m.

Ballistic Impact and Crashworthiness of Aerospace Structures III

Session Chair: Justin D. Littell (NASA Langley Research Center, USA)

341 - Experimental Techniques for Material Characterization of Composites for Modeling Impact Analysis

Bilal Khaled (Arizona State University, USA)

342 - Comparison of Impact Damage from Spin Pit and Flat Panel Gas Gun Testing

Xinran Xiao (Michigan State University, USA)

343 - Evaluation of Low Temperature Effects on Impact and Bending Properties of Composite Sandwich Structures

M.H. Khan (The University of Akron, USA)

344 - Effects of Adiabatic Heating on the High Strain Rate Deformation Response of Triaxially Braided Polymer Matrix Composites

Christopher Sorini (Arizona State University, USA)

SYMPOSIUM 4: Structures in Challenging Environments: Dynamics, Controls, Smart Structures, Health Monitoring, and Sensors

Huron

2:00 p.m. - 3:30 p.m.

Specialized Sensors-based Structural Damage Detection and Health Monitoring II

Session Chairs: Xiong (Bill) Yu (Case Western Reserve University,
USA); Shi Yan (Shenyang University, China)

445 - Damage Detection for Plate-Like Structures Using Generalized Curvature Mode Shape Method

Mijia Yang (North Dakota State University, USA)

446 - Damage Characteristics of High Temperature Treated PVA-ECC Beam under Impact Loading Using Smart Aggregates

B. X. Qi (Shenyang Jianzhu University, China)

447 - Detection of Impact Damage on PVA-ECC Beam Using Infrared Thermography

Baoxin Qi (Shenyang Jianzhu University, China)

448 - Piezoceramic Smart Washer Enabled Bolt Pre-load Monitoring Using Impedance Method

Dongdong Chen (State Key Laboratory of Coastal and
Offshore Engineering, China)

SYMPOSIUM 4: Structures in Challenging Environments: Dynamics, Controls, Smart Structures, Health Monitoring, and Sensors

Carnegie

2:00 p.m. - 3:30 p.m.

Tensegrity-Concept and Applications II

Session Chairs: Landolf Rhode-Barbarigos (University of Miami,
USA); David Surovik (Rutgers University, USA)

415 - New Approaches to Mechanizing Tensegrity Structures

Dorothea Blostein (Queen's University, Canada)

416 - Tensegrity-Inspired Wheel with Force-Based Motion

I. Henry P. Goodell (North Carolina State University, USA)

417 - Semi-active Control of a Tensegrity Bridge

Nizar Bel Hadj Ali (Ecole Polytechnique de Tunisie,
University of Carthage, Tunisia)

418 - An Interdisciplinary Undergraduate Research Studio on Tensegrity Systems for Shape Control and Locomotion through Simulation and Physical Rapid Prototyping

L. Rhode-Barbarigos (University of Miami, USA)

Concurrent Technical Symposia Schedule

Wednesday Afternoon - April 11, 2018 | 4:00 p.m. - 5:30 p.m.

Presentations are noted by corresponding paper number to the Abstracts

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SYMPOSIUM 2:

Exploration and Utilization of Extra-Terrestrial Bodies

Chester

4:00 p.m. – 5:30 p.m.

In-Situ Resource Utilization (ISRU) I

Session Chairs: Laurent Sibille (Ascentech Enterprises, USA); Paul van Susante (Michigan Technological University, USA)

265 - Computational Modeling of Heat Transport and Volatile Extraction from Asteroid Materials

Joel Sercel (Trans Astronautica Corporation, USA)

266 - Reduced Gravity Excavation Cutting Forces Considering Soil Accumulation

K. Skonieczny (Concordia University, Canada)

267 - Sensor Testing for Telerobotic Perception During Asteroid and Mars Regolith Operations

Andrew Nick (NASA Kennedy Space Center, USA)

SYMPOSIUM 2:

Exploration and Utilization of Extra-Terrestrial Bodies

Prospect

4:00 p.m. – 5:30 p.m.

Extraterrestrial Drilling II

Session Chairs: Kris Zacny (Honeybee Robotics, USA); Ryan Timoney (University of Glasgow, United Kingdom)

255 - Atacama Rover Astrobiology Drilling Studies Project: Second Year

B. Glass (NASA Ames Research Center, USA)

256 - Autonomous Regolith Extraction using Real-Time Diagnostics and Dynamic Plan Execution for 1 Meter Class Interplanetary Rotary-Percussive Drills

Thomas R. Stucky (SETI Institute, USA)

258 - What the Atacama Can Tell Us About Subsurface Mars

A. Davé (NASA Ames Research Center, USA)

SYMPOSIUM 3:

Advanced Materials and Designs for Aerospace Structures and Terrestrial Structures under Extreme Environments

St. Clair

4:00 p.m. – 5:30 p.m.

General

Session Chairs: Hongyu Zhou (University of Alabama in Huntsville, USA); An Chen (Iowa State University, USA)

361 - Development of Elastoplastic Design Strategies for Reinforced Structures at Elevated Temperatures

I. Soner Cinoglu (Lehigh University, USA)

362 - Development of an Analytical Model for a Tuned Liquid Multi-Column Damper

An Chen (Iowa State University, USA)

363 - Experimental Analysis of the Pseudoelasticity of Nitinol Shape Memory Alloy Helical Springs

Yuemin Lao (Wuhan University of Technology, China)

364 - Comparison and Discussion of Influential Finite Element Model Updating Methods

Gangbing Song (University of Houston, USA);

Hongnan Li (Dalian University of Technology, China)

SYMPOSIUM 4:

Structures in Challenging Environments: Dynamics, Controls, Smart Structures, Health Monitoring, and Sensors

Huron

4:00 p.m. – 5:30 p.m.

Specialized Sensors-based Structural Damage Detection and Health Monitoring III

Session Chairs: Juan H. Agui (NASA Glenn Research Center, USA); Wei Zhang (University of Connecticut, USA)

449 - Feasibility Research on Interface Debonding Detection in Concrete Filled Steel Tubular Columns Using PZT-based Guided Waves

S. Yan (Shenyang Jianzhu University, China)

451 - Feasibility of SA-based Compactness Monitoring of DCL Compound Concrete

Shuang Hou (South China University of Technology, China)

452 - Local Bond-slip Monitoring in a Steel-plate Ultra-High Performance Concrete (S-UHPC) Beam using Smart Aggregates

Qingzhao Kong (University of Houston, USA)

453 - Optimization Design of Contact Stress Sensor in Cold Strip Rolling

Zhigang Wang (Wuhan University of Science and Technology, China)

SYMPOSIUM 4:

Structures in Challenging Environments: Dynamics, Controls, Smart Structures, Health Monitoring, and Sensors

Carnegie

4:00 p.m. – 5:30 p.m.

Planetary Environment Impact on AIT Requirements for Space Systems

Session Chairs: Alexander M. Jablonski (Canadian Space Agency, Canada); Kin F. Man (NASA Jet Propulsion Laboratory (JPL), USA)

461 - Environmental Requirements and Verification for NASA's Planned Europa Clipper Mission

Kin F. Man (California Institute of Technology, USA)

462 - An Introduction to Assembly Integration and Test (AIT) Requirements for Martian Systems

Alexander M. Jablonski (Canadian Space Agency, Canada)

463 - Dusty Thermal Vacuum (DTVAC) Facility Integration

Roman V. Krazelecky (MPB Communications Inc., Canada)

Concurrent Technical Symposia Schedule

Thursday Morning - April 12, 2018 | 10:30 a.m. - 12:00 p.m.

Presentations are noted by corresponding paper number to the Abstracts

**Denotes Presentation Only*

SYMPOSIUM 2:

Exploration and Utilization of Extra-Terrestrial Bodies

Chester

10:30 a.m. - 12:00 p.m.

In-Situ Resource Utilization (ISRU) II

Session Chair: Robert Mueller (NASA Kennedy Space Center, USA); Joel Sercel (Trans Astronautica, USA)

261 - Lunar In-Situ Resource Utilization – the Key to Human Salvation on Earth
A.A. Ellery (Carleton University, Canada)

262 - Minerals from Space: Terrestrial and Extra-terrestrial Perspectives
P. J. van Susante (Michigan Technological University, USA)

263* - Modeling Tool for Off-Earth Mining Optimization and Resource Processing Based on Geological Contexts
Laurent Sibille (Ascentech Enterprises, USA)

264 - Lunar Mining and Processing for In-Situ Resource Utilization
Purushotham Tukkaraja (South Dakota School of Mines and Technology, USA)

SYMPOSIUM 2:

Exploration and Utilization of Extra-Terrestrial Bodies

Prospect

10:30 a.m. - 12:00 p.m.

Ocean Worlds

Session Chairs: Christopher Yahnker (NASA Jet Propulsion Laboratory (JPL), USA); William Brinckerhoff (NASA Goddard Space Flight Center, USA)

281 - Introduction to Tools and Techniques for Surface Sampling on Europa
Christopher R. Yahnker (NASA Jet Propulsion Laboratory, USA)

282 - LiRS Combined LIBS and DUV Raman Spectrometer for Astrobiology
Roman V. Kruselecky (MPB Communications Inc., Canada)

283 - EMILI: European Molecular Indicators of Life Investigation
A. Grubisic (University of Maryland, USA)

284 - Feasibility of an In-situ Nitrogen Ballast System for the Saturn Titan Submarine
Peter Meyerhofer (Case Western Reserve University, USA)

SYMPOSIUM 3:

Advanced Materials and Designs for Aerospace Structures and Terrestrial Structures under Extreme Environments

St. Clair

10:30 a.m. - 12:00 p.m.

General (Structures)

Session Chair: Wieslaw Binienda (University of Akron, USA)

351 - Additive Construction with Mobile Emplacement: Multifaceted Planetary Construction Materials Development
J. Edmunson (Jacobs Technology Inc., USA)

353 - Soil Mechanics in Vacuum Chamber
G. H. Go (Korea Institute of Civil Engineering and Building Technology, Korea)

354 - Stabilization of Pure Salty Formations of the GOTVAND Dam Lake and another Salty Drought Desert Regions through Invention of Turk Salty Mortar
Afshin Turk (KWPA, Iran); Xiong (Bill) Yu (Case Western Reserve University)

SYMPOSIUM 4:

Structures in Challenging Environments: Dynamics, Controls, Smart Structures, Health Monitoring, and Sensors

Huron

10:30 a.m. - 12:00 p.m.

Renewable Energy Harvesting Systems and Structures

Session Chairs: Benjie Balsler (Ion Power Group, LLC, USA); Lukasz Kiskowski (Military University of Technology, Poland)

471 - Fabrication of Flexible Thermoelectric Energy Harvesting System
Guangxi Wu (Case Western Reserve University, USA)

472 - Low-Head In-stream Hydroelectric Power System
Sebastian Uppapalli (Ion Power Group, USA)

473 - Performance of Solar Cells Integrated with Rigid and Flexible Substrates under Compression
Ahmed Alateeq (Iowa State University, USA)

474* - Responsive Building Envelope Achieved Through Mechanical Metamaterials
Hongyu Zhou (University of Alabama in Huntsville, USA)