15th International LS-DYNA®
Conference & Users Meeting

Edward Hotel & Convention Center, Dearborn, Michigan, USA

June 10-14, 2018

Sunday, June 10, 2018

8:00 a.m. to 5:00p.m. ***Pre-Conference Seminars***

For complete list of courses offered, please visit

http://www.ls-dynaconferences.com/2018/training.htm

7:45 a.m. to 8:45 a.m. Continental Breakfast on Pool Terrace

8:00 a.m. to 9:00 a.m. Training Registration

If bringing laptop, please take your seat by 8:45 a.m.
to allow time for any needed adjustments/corrections.

9:00 a.m. Seminars begin

Lunch and Breaks on Pool Terrace

5:00 p.m. Seminars end

5:00 p.m. to 8:00 p.m.	***Conference Registration***	**Regency J**
5:00 p.m. to 8:00 p.m.	***Exhibitor Booths Open***	**Great Lakes Center**
6:00 p.m. to 8:00 p.m.	***Welcome Reception***	**Great Lakes Center**
	Sponsored by FEA Information and Distributors	

Monday, June 11, 2018

7:30 a.m. to 4:00 p.m. ***Conference Registration*** **Regency J**

7:30 a.m. to 8:20 a.m. ***Breakfast*** **Great Lakes Center**

8:00 a.m. to 6:00 p.m. ***Exhibition Booths Open*** **Great Lakes Center**

8:20 a.m. **Welcome and Opening Remarks**
Roger Grimes *LSTC*

8:35 a.m. **Plenary Presentations**
Session Chair: John Hallquist *LSTC*

8:35 a.m. **"The Isogeometric Approach to Analysis"**
Prof. Thomas J.R. Hughes
Professor of Aerospace Engineering and Engineering Mechanics, University of Texas

9:15 a.m. **"Application of Reduced Model to Simulations of Occupant Protection and Crashworthiness at Toyota"**
Dr. Tsuyoshi Yasuki
Project General Manager, Advanced CAE Division, Toyota Motor Corporation

9:55 a.m. to 10:05 a.m. ***Coffee Break***

10:05 a.m. **Sponsor Presentations**
"ACP OpDesign: Optimal Design Gateway "
Akbar Farahani, Engineering Technology Associates, Inc. (ETA)

10:15 a.m. **"LSTC-ANSYS: A winning Partnership"**
Dale Ostergaard, ANSYS

10:25 a.m. **Plenary Presentation**
"Advances in Linear Algebra Technology and the Impact on Applications Using LS-DYNA®"
Roger Grimes, LSTC

11:05 a.m. **Keynote Presentations**: *concurrent presentations*

11:05 a.m. Session Chair: Uli Franz *(DYNAmore GmbH)* **Marquis Ballroom (2nd floor)**

"Experience with Material and Fracture Modeling at Fiat Chrysler Automobiles (FCA)"
Paul Du Bois, Consultant
Dr. Anantharam Sheshadri, FCA

Monday, June 11, 2018 (continued)

11:05 a.m. **Keynote Presentations**: *concurrent presentations (continued)*

11:05 a.m. Session Chair: Xinhai Zhu *(LSTC)* — **Regency A-B**

"Integrated Computational Materials Engineering (ICME) for Carbon Fiber Composites"
Dr. Danielle Zeng, Ford Motor Company

11:05 a.m. Session Chair: David Benson *(LSTC)* — **Regency C-D**

"Modeling & Simulation Challenges at the Interface Between Man and Machine: Medical Devices"
Dr. Mark Palmer, Medtronic

11:05 a.m. Session Chair: Isheng Yeh *(LSTC)* — **Desoto (2nd floor)**

"The New Features in LS-PrePost 4.5 and the Direction of its Future Development"
Philip Ho, LSTC

11:45 a.m. to 1:00 p.m. ***Lunch – Sponsored by Arup*** — **Great Lakes Center**

Session 1 Automotive (1)

Chair: **Ye-Chen Pan** *(General Motors)* — **Marquis Ballroom (2nd floor)**

1:00 p.m. **Occupant Response in Rollover Crashworthiness Assessment of Cutaway Bus**
Seyedi, MR. (Florida State University)

1:25 p.m. **Influence of Side Windows Type on Occupants' Injury Response in the Cutaway Bus Rollover Analyses**
Dolzyk, G. (Florida State University)

1:50 p.m. **Multi-Layer Aluminum Formability Assessment Using Composite Shells in LS-DYNA® with the Linear Fracture Line Approach**
Burrows, R. (Novelis Global RD&T Center)

2:15 p.m. **Development and Validation of a Finite Element Model of an Energy-absorbing Guardrail End Terminal**
Meng, Y. (Virginia Tech)

2:40 p.m. **Challenges of Predicting Impacts with Roadside Safety Hardware: Recent Case Studies**
Abu-Odeh, A. (Texas A&M Transportation Institute)

Session 2 Metal Forming (1)

Chair: **Ming Shi** *(United States Steel Corporation)* — **Desoto (2nd floor)**

1:00 p.m. **Calibration of GISSMO Model for Fracture Prediction of A Super High Formable Advanced High Strength Steel**
Chen, M. (United States Steel Corporation)

1:25 p.m. **Comparison of Single Point Incremental Forming and Conventional Stamping Simulation**
Perez-Santiago, R. (Universidad de las Americas)

1:50 p.m. **Stretching Failure Prediction in LS-PrePost by a SCL Realized Ductile Failure Criterion**
Sheng, Z.Q. (General Motors)

2:15 p.m. **Plasticity and Damage Modeling of the AA7075 Aluminium Alloy for Hot Stamping**
D'Amours, G. (National Research Council Canada)

2:40 p.m. **Recent Improvements in LS-DYNA® Metal Forming Material Models**
Zheng, J. (LSTC)

Monday, June 11, 2018 (continued)

Session 3 Composites (1)

Chair: **Venkat Aitharaju** *(General Motors)* — **Bugatti Royale (2nd floor)**

1:00 p.m. **Modeling the Axial Crush Response of CFRP Tubes Using MAT054, MAT058 and MAT262 in LS-DYNA®**
Cherniaev, A. (University of Waterloo)

1:25 p.m. **A Peridynamic Model for Damage Prediction of Fiber Reinforced Composite Laminate**
Ren, B. (LSTC)

1:50 p.m. **Modeling of Carbon-Fiber-Reinforced Polymer (CFRP) Composites in LS-DYNA® with Optimization of Material and Failure Parameters in LS-OPT®**
Dong, S. (The Ohio State University)

2:15 p.m. **A Study on Delamination Behavior Between Aluminum and CFRTP**
Okamura, M. (JSOL Corporation)

2:40 p.m. **Modeling the Post-Peak Behavior for Crashworthiness Prediction of Composite Structures**
Xiao, X. (Michigan State University)

Session 4 Blast (1)

Chair: **Nima Edjtemai** *(DYNAmore France)* — **Stanley Steamer (2nd floor)**

1:00 p.m. **Experiments and Simulations of Explosives: Shock Wave Propagation around a Convex Structure**
Van Dorsselaer, N. (Institut de Radioprotection et de Sûreté Nucléaire (IRSN)

1:25 p.m. **LS-DYNA® ALE Modeling of Blast in an Urban Environment**
Medyanik, S. (Michigan Engineering Services, LLC)

1:50 p.m. **Simulation of the Performance of Passenger Rail Vehicles under Blast Conditions in LS-DYNA®**
Lancelot, F. (Arup)

2:15 p.m. **Effect of Explosive Charge Geometry on Boundary Surface Peak Pressure with Regard to Standoff Distance**
Hamilton, J. (Karagozian & Case, Inc.)

Proceedings Book only **An Engineering Approach to Estimating Partially Saturated Soil Constitutive Properties Using LS-DYNA®**
Schwer, L. (Schwer Engineering & Consulting Services)

Session 5 Occupant Modeling (1)

Chair: **Russ Morris** *(Autoliv)* — **Stearns Knight (2nd floor)**

1:00 p.m. **Latest FE Model Development of THOR-50M Crash Test Dummy**
Zhou, Z. (Humanetics Innovative Solutions, Inc.)

1:25 p.m. **A Study of Pedestrian Kinematics and Injury Outcomes Caused by a Traffic Accident with Respect to Pedestrian Anthropometry, Vehicle Shape, and Pre-Impact Conditions**
Untaroiu, C. (Virginia Tech)

1:50 p.m. **Preliminary Validation of a Detailed Finite Element Model of a 50th Percentile Male Pedestrian**
Pak, W. (Virginia Tech)

2:15 p.m. **Development of LSTC WorldSID Dummy Finite Element Model (50th Percentile Male)**
Tahan, F. (George Mason University)

Monday, June 11, 2018 (continued)

Session 6 Biomedical

Chair: **Alexander Gromer** *(DYNAmore Corporation)* — Pierce Arrow (2nd floor)

1:00 p.m. **Constitutive Modeling of Biological Soft Tissues**
Benson, D. (LSTC)

1:25 p.m. **Cardiac Electrophysiology using LS-DYNA®**
L'Eplattenier, P. (LSTC)

1:50 p.m. **Numerical Simulation Transcatheter Aortic Valve Implantation and Mechanics of Valve Function**
Hamid, MS. (Advanced Computational Systems LLC)

2:15 p.m. **CFD Validations with FDA Benchmarks of Medical Devices Flows**
Huang, C-J. (LSTC)

Session 7 Constitutive Modeling (1)

Chair: **André Haufe** *(DYNAmore GmbH)* — Rolls Royce (2nd floor)

1:00 p.m. **High Strain Rate Testing and Material Modeling of an Anisotropic Glass Fiber Filled Polyetherimide**
Teller, S. (Veryst Engineering)

1:25 p.m. **Dynamic Constitutive Model for Polymers with Considering Strength-Differential Effect and Strain Rate Dependency**
Akita, R. (ITOCHU Techno-Solutions Corporation)

1:50 p.m. **Modeling of Crazing in Rubber-toughened Polymers with LS-DYNA®**
Helbig, M. (DYNAmore GmbH)

2:15 p.m. **Bake-Hardening Effect in Dual-Phase Steels: Experimental and Numerical Investigation**
Andrade, F. (DYNAmore GmbH)

2:40 p.m. **Accounting for Rate Dependency of Deformation and Failure on Crash Simulations of Advanced High Strength Steels**
Alturk, R. (Clemson University)

Session 8 FSI / ALE

Chair: **Mohammad Usman** *(Ford Motor Company)* — Regency A

1:00 p.m. **Recent Developments in LS-DYNA® S-ALE**
Chen, H. (LSTC)

1:25 p.m. **Comparative Analysis of Occupant Responses Between LS-DYNA® Arbitrary LaGrange in Euler and (ALE) and Structured–ALE (S-ALE) Methods**
Babu, V. (U.S. Army, Research Development & Engineering Command)

1:50 p.m. **Calculation of the Velocity and Shape of an Explosively Formed Projectile (EFP) Using Axisymmetric ALE**
Puryear, J. (ABS Group)

2:15 p.m. **Phase Change Equation of State for FSI Applications**
Souli, M. (Lille University)

2:40 p.m. **Simulation and Testing Assessment of Cruciform Parachutes using LS-DYNA® ALE**
Rose, T. (US. Army Natick Soldier Research)

Monday, June 11, 2018 (continued)

Session 9 ICFD (1)

Chair: **Sunil Sinha** *(The Ohio State University)* — **Regency B**

1:00 p.m. **Fluid Structure Interaction Simulation of Hood Flutter**
Dilworth, J. (Arup)

1:25 p.m. **Airdrop Sequence Simulation using LS-DYNA® ICFD Solver and FSI Coupling**
Le Garrec, M. (DynaS+)

1:50 p.m. **The Investigation of Parachute Suspension Line Fluid-Structure Interactions using LS-DYNA® ICFD**
Barry, C. (University of Massachusetts Lowell)

2:15 p.m. **Investigating the Post Processing of LS-DYNA® in a Fully Immersive Workflow Environment**
Helwig, E. (LSTC)

Session 10 Simulation

Chair: **Mark Neal** *(General Motors)* — **Regency C**

1:00 p.m. **Rapid Simulations of Welding and AM using LS-DYNA® and LS-PrePost®**
Schill, M. (DYNAmore Nordic AB)

1:25 p.m. **Impact Test Simulation for Nuclear Power Plant Safety under Tornado Disaster**
Tokura, S. (Tokura Simulation Research)

1:50 p.m. **Corrugated Fiber Board as a Packaging Material: Experimental and Numerical Analysis of the Mechanical Behavior**
Kattamuri, C.S. (CADFEM Engineering Services India Pvt.Ltd.)

2:15 p.m. **Simulation of Overhead Crane Wire Ropes Utilizing LS-DYNA®**
Smyth, A. (LPI, Inc.)

2:40 p.m. **Test Validated Multi-Scale Simulation of a Composite Bumper Under Impact Loading**
Baid, H. (Alpha Star Corporation)

Session 11 NVH (1)

Chair: **Yun Huang** *(LSTC)* — **Regency D**

1:00 p.m. **Verification of Sound Absorption Characteristics Constituted Porous Structure**
Yoshimachi, T. (JSOL Corporation)

1:25 p.m. **Random Vibration Fatigue Life Simulation of Bolt-on Metal Brackets using LS-DYNA®**
Park, J. (General Motors)

1:50 p.m. **Sound Absorbing Porous Material in Statistical Energy Analysis**
Cui, Z. (LSTC)

2:15 p.m. **Dynamic Design Analysis Method to Evaluate Shipboard Shock in LS-DYNA®**
Koehler, M. (U.S. Navy – Naval Surface Warfare Center)

2:40 p.m. **Advances in Fatigue Analysis with LS-DYNA®**
Huang, Y. (LSTC)

3:05 p.m. to 3:25 p.m. ***Coffee Break – Sponsored by TOTAL CAE*** — **Great Lakes Center**

Monday, June 11, 2018 (continued)

Session 12 Automotive (2)

Chair: **Tau Tyan** *(Ford Motor Company)* — **Marquis Ballroom (2nd floor)**

3:25 p.m. **Facing Future Challenges in Crash Simulation Engineering – Model Organization, Quality and Management at Porsche**
Mattern, S. (DYNAmore GmbH)

3:50 p.m. **Damage and Failure Model Characterization for High Strength AA6000 Automotive Aluminium Alloys**
S. Jurendic (Novelis Deutschland GmbH, R&D Centre)

4:15 p.m. **Towards an Automatic Evaluation of a Car Floor Module in a Pole Crash Load Case**
Diermann, V. (Daimler AG)

4:40 p.m. **The Role of LS-DYNA® in the Design of the New London Electric Taxi**
Dennis, J. (Arup, Advanced Technology and Research)

5:05 p.m. **Numerical Simulations of Vehicle Restraint Systems**
Šebík, M. (SVS FEM s.r.o.)

5:30 p.m. **Multi-scale material modeling applied from Specimen to Full Car level with LS-DYNA®**
Calmels, S. (e-Xstream Engineering)

Session 13 Metal Forming (2)

Chair: **Trevor Dutton** *(Dutton Simulation)* — **Desoto (2nd floor)**

3:25 p.m. **Advances in LS-DYNA® for Metal Forming (I)**
Zhu, X. (LSTC)

3:50 p.m. **Advances in LS-DYNA® for Metal Forming (II)**
Zhang, L. (LSTC)

4:15 p.m. **Theoretical and LS-DYNA® Analysis of Springback Effect on U-Shape Part Top Shape**
Qin, Z. (General Motors)

4:40 p.m. **A Customized Job Manager for Metal Forming Simulations with LS-DYNA®**
Xiao, Y. (LSTC)

5:05 p.m. **Model Set up, Analysis and Results of the Inverse Forming tool in ANSA**
Iordanidou, E. (BETA CAE Systems SA)

5:30 p.m. **A Study in Mass Scaling for Sheet Metal Forming Simulations with LS-DYNA ®**
Du Bois, J.H. (Forming Simulation Technology LLC)

Session 14 Composites (2)

Chair: **Karl Schweitzerhof** *(DYNAmore GmbH)* — **Bugatti Royale (2nd floor)**

3:25 p.m. **A Non-linear Strain-rate Micro-mechanical Composite Material Model for Impact Problems**
Tabiei, A. (University of Cincinnati)

3:50 p.m. **Computational Modeling of Adiabatic Heating in Triaxially Braided Polymer Matrix Composites Subjected to Impact Loading via a Subcell Based Approach**
Sorini, C. (Arizona State University)

4:15 p.m. **Realistic Stochastic Virtual Microstructure Generation for Woven Fabrics and Textile Composites: The Thermal Growth Approach**
Nilakantan, G. (Teledyne Scientific & Imaging)

4:40 p.m. **Virtual Ballistic Testing of Kevlar Soft Armor: Predictive and Validated Modeling of the V0-V100 Probabilistic Penetration Response**
Nilakantan, G. (Teledyne Scientific & Imaging)

5:05 p.m. **Modeling of a Cross-Ply Thermoplastic for Thermoforming of Composite Sheets in LS-DYNA®**
White, K. (University of Massachusetts Lowell)

5:30 p.m. **Meso-scale Modeling of Carbon Fiber Composites for Crash Simulation**
Lam, D. (Ford Motor Company

Session 15 Blast (2)

Chair: **M. Sahul Hamid** *(Advanced Computational Systems LLC)* — **Stanley Steamer (2nd floor)**

3:25 p.m. **Scalability Study of Particle Method with Dynamic Load Balancing**
Teng, H. (LSTC)

3:50 p.m. **Mesh Sensitivity of Blast Wave Propagation**
Powell, D. (Baker Engineering and Risk Consultants)

4:15 p.m. **Implementation of MCEER TR 14-0006 Blast Load Curves in LS-DYNA® and Benchmark to Commonly Practiced Blast Loading Application Methods**
Wilson, D. (Arup)

4:40 p.m. **Developing a Numerical Model for Human Brain under Blast Loading**
Yucesoy, A. (Michigan State University)

Session 16 Occupant Modeling (2)

Chair: **Chin-Hsu Lin** *(General Motors)* — **Stearns Knight (2nd floor)**

3:25 p.m. **A Comparison Between Two Methods of Head Impact Reconstruction**
Talebanpour, A. (Washington State University)

3:50 p.m. **Subject-Specific Modeling of Human Ribs: Finite Element Simulations of Rib Bending Tests, Mesh Sensitivity, Model Prediction with Data Derived From Coupon Tests**
Yates, K. (Virginia Tech)

4:15 p.m. **Evaluation of the Injury Risks of Truck Occupants Involved in a Crash as a Result of Errant Truck Platoons**
Jin, H. (Virginia Tech)

4:40 p.m. **Multi-scale Validation of a Butyl Rubber Neck Model for an Anthropomorphic Testing Device Designed for Underbody Blast**
Baker, A. (Wake Forest School of Medicine)

Session 17 Isogeometric Analysis (IGA)

Chair: **Chris Galbraith** *(Metal Forming Analysis Corp)* — **Pierce Arrow (2nd floor)**

3:25 p.m. **Recent Developments in Isogeometric Analysis for LS-DYNA®**
Benson, D. (LSTC)

3:50 p.m. **Sheet metal forming simulation with IGA in LS-DYNA®**
Hartmann, S. (DYNAmore GmbH)

4:15 p.m. **Recent Developments in Isogeometric Analysis with Solid Elements in LS-DYNA®**
Li, L. (LSTC)

4:40 p.m. **U-splines for Unstructured IGA Meshes in LS-DYNA®**
Scott, M. (Brigham Young University)

Session 18 Constitutive Modeling (2)

Chair: **Thomas Münz** *(DYNAmore GmbH)* — **Rolls Royce (2nd floor)**

3:25 p.m. **A Continuum Model of Deformation and Damage for API X70 Steel Based on the Theory of Strain Gradient**
Anazi, M. (Washington State University)

3:50 p.m. **An Enhancement of LS-DYNA® XFEM Shells for Dynamic Ductile Failure Analysis**
Guo, Y. (LSTC)

4:15 p.m. **process2product Simulation: Closing Incompatibilities in Constitutive Modeling and Spatial Discretization with envyo®**
Liebold, C. (DYNAmore GmbH)

4:40 p.m. **Multiscale Model Analysis of the Effects of Martensite Morphology and Martensite Volume Fraction on the Mechanical Property of Dual-Phase (DP) Steels: Parametric Study**
Belgasam, T. (Washington State University)

5:05 p.m. **Zoning Method for Efficient Material Properties Calculation**
Kronsteiner, J. (Leichtmetallkompetenzzentrum Ranshofen GmbH)

Session 19 Aerospace (1)

Chair: **Tom Vasko** *(Central Connecticut State University)* — **Regency A**

3:25 p.m. **Generating Experimental Data for a Three-Dimensional Generalized Composite Material Model**
Khaled, B. (Arizona State University)

3:50 p.m. **Using MAT213 for Simulation of High-Speed Impacts of Composite Structures**
Shyamsunder, L. (Arizona State University)

4:15 p.m. **Development and Verification of an Orthotropic Elasto-Plastic Three-Dimensional Model with Tabulated Input Suitable for Use in Composite Impact Problems**
Goldberg, R. (NASA Glenn Research Center)

4:40 p.m. **Evaluation of Aircraft Structures Crashworthiness Behavior using Finite Element Analysis**
Zinzuwadia, C. (Wichita State University)

Session 20 ICFD (2)

Chair: **Nils Karajan** *(DYNAmore Corporation)* — **Regency B**

3:25 p.m. **FSI Capabilities for the CESE and Chemistry Solvers in LS-DYNA®**
Im, K-S. (LSTC)

3:50 p.m. **ICFD: Summary of Recent and Future Developments**
Del Pin, F. (LSTC)

4:15 p.m. **FSI Simulation of a Double-deck Bus Cornering under Crosswind Effects**
Paz, R. (LSTC)

4:40 p.m. **Computational Approach to Detect Instability and Incipient Motion of Large Riprap Rocks**
Bojanowski, C. (Argonne National Laboratory)

Session 21 Topology & Shape Optimization

Chair: **Marcus Redhe** *(DYNAmore Nordic AB)* — **Regency C**

3:25 p.m. **Implementation of the Projected Subgradient Method in LS-TaSC™**
Roux, W. (LSTC)

3:50 p.m. **Design Domain Dependent Preferences for Multi-disciplinary Body-in-White Concept Optimization**
Aulig, N. (Honda Research Institute Europe GmbH)

4:15 p.m. **Detail Design Evaluation of Extruded Sections on a Body-in-White Concept Model**
Ramnath, S. (The Ohio State University)

4:40 p.m. **Topology Optimization of a Stamping Die Structure using LS-DYNA® and LS-TaSC™**
Erancheri, J. (Kaizenat Technologies Pvt Ltd)

5:05 p.m. **ACP-OpDesign: Optimal Design Gateway : Reveal the Path to Optimized Products**
Kaloudis, A. (BETA CAE Systems International AG)

Session 22 NVH (2)

Chair: **Isheng Yeh** *(LSTC)* — **Regency D**

3:25 p.m. **Discussion on NVH Analysis with Various Eigensolvers in LS-DYNA®**
Cui, Z. (LSTC)

3:50 p.m. **LS-DYNA®'s Linear Solver Development — Phase 1: Element Validation Part I**
Li, A. (Ford Motor Company)

4:15 p.m. **LS-DYNA®'s Linear Solver Development — Phase1: Element Validation Part II**
Cui, Z. (LSTC)

4:40 p.m. **LS-DYNA®'s Linear Solver Development — Phase 2: Linear Solution Sequence**
Huang, Y. (LSTC)

5:05 p.m. **Qualification of Launcher Tank Dynamic Behavior through Vibratory Experiments using Discrete Element Spheres**
Legaud, T. (DynaS+)

6:30 p.m. to 9:00 p.m. ***Conference Banquet and Entertainment*** **Great Lakes Center**

Sponsored by ANSYS

Tuesday, June 12, 2018

7:30 a.m. to 12:00 p.m.	***Conference Registration***	**Regency J**
7:30 a.m. to 8:20 a.m.	***Breakfast***	**Great Lakes Center**
8:00 a.m. to 6:00 p.m.	***Exhibition Booths***	**Great Lakes Center**

Session 23 Metal Forming (3)

Chair: **Feng Ren** *(Ford Motor Company)* — **Desoto (2nd floor)**

8:25 a.m. **Improvement of Mesh Fusion in LS-DYNA®**
Fan, H. (LSTC)

8:50 a.m. **Tube Adaptivity for Mesh Fission/Fusion in LS-DYNA®**
Fan, H. (LSTC)

9:15 a.m. **Explicit and implicit Simulations for Die-Less-Hydroforming-Structures including Welding, Forming and Load Capacity using LS-DYNA® and DynaWeld®**
Metzger, A. (Karlsruhe Institute of Technology)

Session 24 Composites (3)

Chair: **Khaled Shahwan** *(Fiat Chrysler Automobiles)* — **Bugatti Royale (2nd floor)**

8:25 a.m. ***MAT_4A_MICROMEC: Theory and Application Notes**
Reithofer, P. (4a Engineering)

8:50 a.m. **Three-Dimensional Integrated Simulation for Composite Sheet Compression Molding**
Vallury, S. (Moldex3D)

9:15 a.m. **Material Models for Thermoplastics in LS-DYNA® From Deformation to Failure**
Reithofer, P. (4a Engineering)

Session 25 SPG

Chair: **Jim Kennedy** *(KBS2)* — **Stanley Steamer (2nd floor)**

8:25 a.m. **Simulation of Self-Piercing Rivet Insertion Using Smoothed Particle Galerkin Method**
Huang, L. (Ford Motor Company)

8:50 a.m. **Parametric and Convergence Studies of the Smoothed Particle Galerkin (SPG) Method in Semi-brittle and Ductile Material Failure Analyses**
Wu, Y. (LSTC)

9:15 a.m. **Smoothed Particle Galerkin Method with a Momentum-Consistent Smoothing Algorithm for Coupled Thermal-Structural Analysis**
Pan, X. (LSTC)

9:40 a.m. **The Immersed Smoothed Particle Galerkin Method for Material Failure Analysis of Fiber-Reinforced Solid Structures**
Hu, W. (LSTC)

Session 26 Occupant Protection (1)

Chair: **Amit Nair** *(LSTC)* — Stearns Knight (2nd floor)

8:25 a.m. **IIHS Side Impact Parametric Study**
Reichert, R. (George Mason University)

8:50 a.m. **LS-DYNA® Belted Occupant Model**
Chen, C. (Ford Motor Company)

9:15 a.m. **Recent Developments in *DEFINE_PRESSURE_TUBE for Simulating Pressure Tube Sensors in Pedestrian Crash**
Karlsson, J. (DYNAmore Nordic AB)

Session 27 Thermal

Chair: **Inaki Çaldichoury** *(LSTC)* — Pierce Arrow (2nd floor)

8:25 a.m. **Thermo-Mechanical Approach Using LS-DYNA® to Predict Tool Shape for Insert Molded ARPRO® (EPP) Rear Seat Cushion/Riser**
Huda, N. (JSP International)

8:50 a.m. **Recent Updates to the Structural Conjugate Heat Transfer Solver**
Hartmann, S. (DYNAmore GmbH)

Session 28 Constitutive Modeling (3)

Chair: **Ala Tabiei** *(The University of Cincinnati)* — Rolls Royce (2nd floor)

8:25 a.m. **Workflow based Material Characterization for LS-DYNA® in d3VIEW**
Bala, S. (LSTC, d3VIEW)

8:50 a.m. **A Zero Thickness Cohesive Element Approach For Dynamic Crack Propagation**
Tabiei, A. (The University of Cincinnati)

Proceedings Book only **Implementation and Validation of an Advanced Hypoplastic Model for Granular Material Behavior**
Bakroon, M. (Technische Universität Berlin)

Session 29 Aerospace (2)

Chair: **Tom Vasko** *(Central Connecticut State University)* — Regency A

8:25 a.m. **Strain Rate and Temperature Dependent Testing in Support of the Development of MAT224 and MAT213**
Gilat, A. (The Ohio State University Department of Mechanical and Aerospace Engineering)

8:50 a.m. **The Effect of Inconel-718 High Strain Rate Sensitivity on Ballistic Impact Response using *MAT_224**
Dolci, S. (George Mason University)

9:15 a.m. **A Temperature and Strain Rate Dependent Material Model with Tension-Compression Asymmetry for 0.25 inch Ti-6Al-4V Plate**
Wang, L. (George Mason University)

Session 30 Computing Technology (1)

Chair: **Alex Akkerman** *(Ford Motor Company)* — Regency B

8:25 a.m. **Performance Analysis of LS-DYNA® in Huawei HPC Environment**
Lui, P. (Huawei Technologies)

8:50 a.m. **In Core Adaptivity**
Wainscott, B. (LSTC)

9:15 a.m. **Maximizing LS-DYNA® Performance and Scalability with In-Network Computing Acceleration Engines**
Shainer, G. (HPC Advisory Council)

9:40 a.m. **qd – Build Your Own LS-DYNA® Tools Quickly in python**
Diez, C. (Lasso GmbH Germany)

Session 31 Optimization (1)

Chair: **Sharath Varadappa** *(General Motors)* — Regency C

8:25 a.m. **Multi-disciplinary Optimization using LS-DYNA®**
Saiyed, A. (Wayne State University)

8:50 a.m. **Optimizing the Biofidelity of the Warrior Injury Assessment Manikin through Design of Experiments**
Boyle, M. (The Johns Hopkins University Applied Physics Laboratory)

9:15 a.m. **Study of Drop Test Parameters Using Design of Experiments**
Jain, P. (Tata Technologies Ltd.)

9:40 a.m. **Application of a Full-Field Calibration Concept for Parameter Identification of HS-Steel with LS-OPT®**
Ilg, C. (DYNAmore GmbH)

Session 32 Post-Processing

Chair: **Philip Ho** *(LSTC)* — Regency D

8:25 a.m. **Combined Analysis of LS-DYNA® Crash-Simulations and Crash-Test Scans**
Borsotto, D. (SIDACT GmbH)

8:50 a.m. **Advanced Results Databases Compression Techniques to Allow their Efficient Use in Results Data Management Systems**
Perifanis, A. (BETA CAE Systems S.A.)

9:15 a.m. **A Unified Environment for Collaborative CAE and Immersive Simulation results Processing**
Kleidarias, S. (BETA CAE Systems S. A.)

10:05 a.m. to 10:25 a.m. ***Coffee Break – Sponsored by BETA CAE*** — Great Lakes Center

Session 33 Implicit

Chair: **Daniel Hilding** *(DYNAmore Nordic AB)* — **Marquis Ballroom (2nd floor)**

10:25 a.m. **A Survey of Eigen Solution Methods in LS-DYNA®**
Grimes, R. (LSTC)

10:50 a.m. **Increasing the Scale of LS-DYNA® Implicit Analysis**
Lucas, R. (LSTC)

11:15 a.m. **An Enhanced Assumed Strain (EAS) Solid Element for Nonlinear Implicit Analyses**
Borrvall, T. (DYNAmore Nordic AB)

11:40 a.m. **Modeling bolts in LS-DYNA® using Explicit and Implicit Time Integration**
Karajan, N. (DYNAmore Corporation)

12:05 p.m. **Re-using Crash Models for Static Load Cases with Minimal Effort**
Jonsson, A. (DYNAmore Nordic AB)

Session 34 Modeling

Chair: **Sukhi Bilkhu** *(Mahindra North America Tech Center)* — **Desoto (2nd floor)**

10:25 a.m. **Getting Your Model 'Right' – Checking Before, During and After Your LS-DYNA® Analysis**
Newlands, G. (Arup)

10:50 a.m. **Efficiency Improvement of Seat Belt Pull CAE Analysis by Technology and Process Changes**
Ramavath, S. (Ford Motor Company)

11:15 a.m. **Productivity and Quality of LS-DYNA® Analyses: Implementing a Tailor-made Software Solution for the Transport and Storage of Radioactive Materials**
Marchaud, G. (ORANO TN)

11:40 a.m. **Numerical Ricochet Model of a 7.62 mm Projectile Penetrating an Armor Steel Plate**
Becker, M. (French-German Research Institute of Saint-Louis)

12:05 p.m. **Crash Simulation of Mechanical Joints with Automatically-Determined Model Parameters Based on Test Results and Prediction Algorithms**
Sommer, S. (Fraunhofer IWM)

Session 35 Composites (4)

Chair: **Khaled Shahwan** *(Fiat Chrysler Automobiles)* — **Bugatti Royale (2nd floor)**

10:25 a.m. **Delamination Prediction and Non-local Averaging using a Composite Micro-Mechanical Model**
Tabiei, A. (University of Cincinnati)

10:50 a.m. **A Non-orthogonal Material Model of Woven Composites in the Preforming Process**
Zhao, J. (LSTC)

11:15 a.m. **Forming Simulation for Fiber Reinforced Thermoplastic with Introduction to J-Composites**
Nishi, M. (JSOL Corporation)

11:40 a.m. **Development of a One-Step Analysis for Preforming of Woven Carbon Fiber Composites**
Zeng, D. (Ford Motor Company)

12:05 p.m. **Development of New Simulation Technology for Compression Molding of Long Fiber Reinforced Plastics using LS-DYNA®**
Hayashi, S. (JSOL Corporation)

Proceedings Book only **Simulation of the Braiding Process in LS-DYNA®**
Razavi, S. (Imperial College London)

Tuesday, June 12, 2018 (continued)

Session 36 SPH

Chair: **Uli Franz** *(DYNAmore GmbH)* — **Stanley Steamer (2nd floor)**

10:25 a.m. **Fluid Flow Modeling with SPH in LS-DYNA®**
Yreux, E. (LSTC)

10:50 a.m. **Multiscale Simulations of Material with Heterogeneous Structures Based on Representative Volume Element Techniques**
Liu, Z. (LSTC)

11:15 a.m. **MLS-based SPH in LS-DYNA® for Increased Accuracy and Tensile Stability**
Yreux, E. (LSTC)

Proceedings Book only **Benchmarking Concrete Material Models Using the SPH Formulation in LS-DYNA®**
Schwer, L. (Schwer Engineering & Consulting Services)

Session 37 Occupant Protection (2)

Chair: **Stephen Kang** *(Ford Motor Company)* — **Stearns Knight (2nd floor)**

10:25 a.m. **Evaluation of LS-DYNA® Corpuscular Particle Method – Passenger Airbag Applications**
Lin, C-H. (General Motors)

10:50 a.m. **Airbag Folding with JFOLD: Latest Developments and Case Studies**
Ishizuka, T. (JSOL Corporation)

11:15 a.m. **Occupant Injury Criteria, a Complete Solution for the Evaluation of Occupant and Structural, Simulation and Physical Test Results in META**
Tzolas, N. (BETA CAE Systems SA)

11:40 a.m. **Airbag Folding with Generator4 and LS-DYNA® : a Generic Process**
Kaulich, C. (GNS (Gesellschaft für Numerische Simulation) mbH)

Session 38 Electromagnetics

Chair: **Inaki Çaldichoury** *(LSTC)* — **Pierce Arrow (2nd floor)**

10:25 a.m. **Robust FEM-BEM Coupling for LS-DYNA®'s EM module**
Kielhorn, L. (TAILSIT GmbH)

10:50 a.m. **Update on Resistive Spot Welding Capabilities In LS-DYNA®**
Çaldichoury, I. (LSTC)

11:15 a.m. **Safety Modeling of Lithium-ion Batteries under Mechanical Abuse**
Deng, J. (Ford Motor Company)

11:40 a.m. **Randles Circuit Parameters Set Up for Battery Simulations in LS-DYNA®**
Bateau-Meyer, S. (LSTC)

12:05 p.m. **Li-Ion Battery Modeling Strategies for Electric Vehicle Crash Applications**
Seulin, M. (DynaS+)

Session 39 Aerospace (3)

Chair: **Tom Vasko** *(Central Connecticut State University)* — **Regency A**

10:25 a.m. **Numerical Simulation of Aircraft Seat Compliance Test using LS-DYNA® Implicit Solver**
Pathy, S. (LSTC)

10:50 a.m. **Aircraft Seat Row-to-row Head Injury Criteria (HIC) Simulation Using LS-DYNA®**
Chen, E-J. (Boeing Commercial)

11:15 a.m. **Numerical Investigation of a Glider Seat Cushion Under Shock Loading Using LS-DYNA®**
Downes, D. (National Research Council Canada)

11:40 a.m. **Transient Dynamics of Slicing-Impact Loading on Jet Engine Fan Blades during a Bird-strike Event**
Sinha, S. (The Ohio State University)

Session 40 Computing Technology (2)

Chair: **Alex Akkerman** *(Ford Motor Company)* — **Regency B**

10:25 a.m. **LS-DYNA® performance on Intel® Scalable Solutions**
Meng, N. (Intel)

10:50 a.m. **Cloud-based Pedestrian Protection App**
Seshadri, M. (ESI Group)

11:15 a.m. **HPC in the Cloud: Gompute Support for LS-DYNA® Simulations**
Fernandez, I. (Gompute)

Session 41 Optimization (2)

Chair: **Mikael Schill** *(DYNAmore Nordic AB)* — **Regency C**

10:25 a.m. **A Study on Scatter During Production Process using Statistical Approach**
Okamura, M. (JSOL Corporation)

10:50 a.m. **Classification-based Optimization and Probabilistic Analysis Using LS-OPT®**
Basudhar, A. (LSTC)

11:15 a.m. **DIC-based Full-Field Calibration using LS-OPT®: An Update**
Stander, N. (LSTC)

11:40 a.m. **Optimisation of Fixturing Clamps to Improve Panel Measurement Robustness**
Crone, B. (Arup)

12:05 p.m. **Shape Optimization with LS-DYNA® Suite For MDO (Multidisciplinary Design Optimization)**
Ishii, R. (JSOL Corporation)

Session 42 Connections

Chair: **Hwawon Lee** *(General Motors)* — **Regency D**

10:25 a.m. **Modeling and Simulation of PCB Cover Plate for Large Open Joints**
Ranjha, S. (University of Nebraska-Lincoln)

10:50 a.m. **Fatigue Life Prediction of Composite Adhesive Joints using LS-DYNA®**
Tabiei, A. (University of Cincinnati)

11:15 a.m. **Investigation of the Failure Behavior of Bolted Connections under Crash Loads and a Novel Adaption to an Enhanced Abstracted Bolt Model**
Schauwecker, F. (Daimler AG, Research and Development)

11:40 a.m. **Cure History Dependent Viscoelastic Modeling of Adhesively Bonded Joints using MAT_277 in LS-DYNA ®**
Agha, A. (Clemson University - International Center for Automotive Research)

12:05 p.m. **Characterization and Modeling of Spot-Weld Joints with *MAT_100_DA Parameter Optimization using LS-OPT®, and 3-Sheet Spot-weld Modeling Method Development in LS-DYNA®**
Khan, Q.; Ghassemi, H. (ArcelorMittal Global R&D)

12:30 p.m. to 1:30 p.m. ***Lunch*** — **Great Lakes Center**

Tuesday, June 12, 2018 (continued)

1:30 p.m. to 3:15 p.m. ***Technical Session -- Technology Today*** **Great Lakes Center**

Presentations by our Sponsors

Session Chair: Uli Franz (DYNAmore GmbH)

1:30 p.m.	ANSYS
1:40 p.m.	Engineering Technology Associates, Inc. (ETA)
1:50 p.m.	d3VIEW
2:00 p.m.	Arup
2:10 p.m.	BETA CAE
2:20 p.m.	TOTAL CAE
2:30 p.m.	DYNAmore
2:40 p.m.	Shanghai Hengstar

2:50 p.m. to 3:30 p.m. ***Coffee Break – Sponsored by Shanghai Hengstar***

3:10 p.m. to 3:30 p.m. ***Raffle Prize Drawings***

3:30 p.m. **Closing Plenary Presentation** **Great Lakes Center**

Session Chair: Nathan Hallquist *LSTC*

"Recent and Ongoing Developments in LS-DYNA®"

LSTC Developers:

John O. Hallquist	Thomas Borrvall	Facundo Del Pin
Jason Wang	Cheng-Tang Wu	Pierre L'Eplattenier
Xinhai Zhu	David Benson	Isheng Yeh
John Zhao	Nielen Stander	

Wednesday-Thursday, June 13-14, 2018

8:00 a.m. to 5:00p.m. ***Post-Conference Seminars***

For complete list of courses offered, please visit

http://www.ls-dynaconferences.com/2018/training.htm

7:45 a.m. to 8:45 a.m. Continental Breakfast on Pool Terrace each day

8:00 a.m. to 9:00 a.m. Training Registration

If bringing laptop, please take your seat by 8:45 a.m. to allow time for any needed adjustments/corrections.

9:00 a.m. Seminars begin

Lunch and Breaks on Pool Terrace each day

5:00 p.m. Seminars end