Welcome to the
11th International LS-DYNA® Users Conference 2010

June 6 - 8, 2010
Hyatt Regency Dearborn
Dearborn, Michigan  USA

Thank you for your participation. Our exciting Conference Program includes:

- 98 Technical Paper Presentations; more included in the Conference Proceedings
- Presentations about the leading Technology Today in High Performance Computing
- Plenary and Keynote Addresses by:
  
  Dr. Thomas J.R. Hughes, Professor of Aerospace Engineering and Engineering Mechanics, Computational and Applied Mathematics Chair III, Institute for Computational Engineering and Sciences (ICES), The University of Texas at Austin
  
  Dr. David J. Benson, Professor of Structural Engineering, Jacobs School of Engineering, University of California, San Diego
  
  Mr. Thomas J. Lange, Director, Corporate R&D, Modeling and Simulation, Procter & Gamble
  
  Dr. Yuichi Kitagawa, Group Manager, Advanced CAE Division, Toyota Motor Corporation
  
  Dr. Rahul Gupta, U.S. Army Research Laboratory, Aberdeen Proving Ground
  
  Mr. Paul A. Du Bois, Consulting Engineer

- Exhibition Featuring State-of-the-Art Hardware and Software
- Presentation by Dr. John O. Hallquist, President, LSTC

Included in the conference packet are the Conference Agenda and Technical Session Locator with Map, our Sponsor Appreciation page, Exhibition Area Layout, and a general Hotel Map.

Remember to fill out your Drawing Entry Form and have it stamped by each Exhibitor. All completely filled entries will be eligible for the Conference Drawing!

If you have any questions regarding the conference, members of our staff will be available to assist you at the Registration Desk. The Registration Desk will also act as a Lost and Found and Message Center for you to contact other attendees.

Please take the time to visit the conference sponsors and the many other companies in the Exhibition Area.

Please wear your Conference Badge at all times. This will help us and the hotel staff to better recognize and serve you.

We hope you have a most enjoyable time!
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### Exhibitor Contact Information

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7:30 a.m. – 4:00 p.m.  Registration  
Great Lakes Center

7:30 a.m. – 8:20 a.m.  Continental Breakfast  
Great Lakes Center

8:00 a.m. – 6:00 p.m.  Exhibition  
Great Lakes Center

8:20 a.m.  Welcome and Opening Remarks – Wayne L. Mindle (LSTC)  
Great Lakes Center

8:35 a.m.  Plenary Presentations  
Great Lakes Center

Session Chair:  John O. Hallquist (LSTC)

8:35  Dr. Thomas J.R. Hughes  
“Isogeometric Analysis (Introduction and Overview)”
Professor of Aerospace Engineering  
and Engineering Mechanics
Computational and Applied Mathematics Chair III  
Institute for Computational Engineering and Sciences (ICES)  
The University of Texas at Austin

9:15  Dr. David Benson  
“Isogeometric Analysis in LS-DYNA®”
Professor of Structural Engineering  
Jacobs School of Engineering  
University of California, San Diego

9:55 a.m.  Coffee Break – Sponsored by ARUP  
Great Lakes Center

10:05  Mr. Rick Young  
“Microsoft Windows HPC:  Vision and Roadmap”
Business Development Manager  
MS HPC Group  
Microsoft Corporation

10:15  Mr. Thomas J. Lange  
“Virtualizing Everyday Life, P&G’s use of Modeling Simulation”
Director  
Corporate R&D  
Modeling and Simulation  
Procter & Gamble

11:05 a.m.  Keynote Presentation  
Regency Ballroom A-B

11:05  Dr. Yuichi Kitagawa  
“Development of New Generation THUMS”
Group Manager  
Advanced CAE Division  
Toyota Motor Corporation

11:05 a.m.  Keynote Presentation  
Regency Ballroom C-D

11:05  Dr. Rahul Gupta  
“Multi-Phase, Multi-Material, LS-DYNA ALE-FSI Approach and  
Development of an Automated Tool for Blast Simulation”
U.S. Army Research Laboratory  
Aberdeen Proving Ground

11:05 a.m.  Keynote Presentation  
Regency Ballroom E-F

11:05  Mr. Paul A. Du Bois  
“Development, Implementation, and Validation of 3-D Failure  
Model for Aluminum 2024 for High Speed Impact Applications”
Consulting Engineer

11:45 a.m.  Lunch  
Great Lakes Center
### 1:00 p.m.  Session 1 – Aerospace (1)

**Desoto Ballroom**

**Session Chair:** Thomas J. Vasko (Central Connecticut State University)

1:00  *Blinzler, B.J., University of Akron,*  
**Investigation of *MAT_58 for Modeling Braided Composites**

1:25 *Chuzel, Y., LaMCoS – INSA,*  
**Development of Hail Material Model for High Speed Impacts on Aircraft Engine**

1:50 *Hu, S., Hamilton Sundstrand,*  
**Engine Impeller Sub-Fragmentation Simulation Using EFG Method**

2:15 *Selezneva, M., Ryerson University,*  
**Modeling Bird Impact on a Rotating Fan: The Influence of Bird Parameters**

2:40 *Rajan, S.D., Arizona State University,*  
**LS-DYNA® Implemented Multi-Layer Fabric Material Model Development for Engine Fragment Mitigation**

### 1:00 p.m.  Session 2 – Automotive (1)

**Marquis Ballroom**

**Session Chair:** Stephen Kang (Ford Motor Company)

1:00 *Chatiri, M., CADFEM GmbH,*  
**An Assessment of the New LS-DYNA® Multi-Layered Solid Element: Basics, Patch Simulation and its Potential for Thick Composite Structural Analysis**

1:25 *Perillo, M., EnginSoft SpA,*  
**Validation of Material Models for the Numerical Simulation of Aluminum Foams**

1:50 *Kolokythas, Y., BETA CAE Systems SA,*  
**LS-DYNA® Durability Load Cases: An Automated Template Driven Process Using the ANSA Task Manager**

2:15 *Tsuda, T., ITOCHU Techno-Solutions Corporation,*  
**Implementation of the Tanimura-Mimura's Strain Rate Dependent Constitutive Model in LS-DYNA® Using User Defined Material Model**

2:40 *Shetty, S.H., ESI Group,*  
**LS-DYNA® “Model Compare” in Visual-Environment**

### 1:00 p.m.  Session 3 – Simulation (1)

**Pierce Arrow Suite**

**Session Chair:** Nima Edjtemai (Alyotech Technologies)

1:00 *Feng, W.W., Livermore Software Technology Corporation,*  
**On the Prony Relaxation Function**

1:25 *Shor, O., Rafael,*  
**Simulation of a Thin Walled Aluminum Tube Subjected to Base Acceleration Using LS-DYNA®’s Vibro-Acoustic Solver**

1:50 *Schwer, L.E., Schwer Engineering & Consulting Services,*  
**A Brief Look at *MAT_NONLOCAL: A Possible Cure for Erosion Illness**
Monday June 7th

2:15 Magallanes, J.M., Karagozian & Case,
Recent Improvements to Release III of the K&C Concrete Model

2:40 Sato, K., JSOL Corporation,
LS-DYNA® and JMAG® Coupling Simulation for Change of SPM Motor Magnetic Properties
Due to Press-Fitting

1:00 p.m. Session 4 – Simulation (2) Rolls Royce Suite
Session Chair: Matthias Hörmann (CADFEM GmbH)

1:00 Huang, Y., Livermore Software Technology Corporation,
New Developments of Frequency Domain Acoustic Methods in LS-DYNA®

1:25 Mendes, S., Worcester Polytechnic Institute,
Investigation of LS-DYNA® Modeling for Active Muscle Tissue

1:50 Guo, Y., Livermore Software Technology Corporation,
XFEM and EFG Cohesive Fracture Analysis for Brittle and Semi-Brittle Materials

2:15 Makino, M., Dynapower Corporation,
Stone Skipping Simulation by ALE and SPH

2:40 Van Dorsselaer, N., Alliance Services Plus,
A Contribution to New ALE 2D Method Validation

1:00 p.m. Session 5 – Blast / Impact (1) Stearns Knight Suite
Session Chair: Ronald L. Hinrichsen (RHAMM Technologies, LLC.)

1:00 Nilakantan, G., University of Delaware,
Novel HPC Using LS-DYNA® to Computationally Assess the V₀-V₁₀₀ Impact Response of
Flexible Fabrics Through Probabilistic Methods

1:25 Gama, B.A., University of Delaware,
Modeling Blast Damage of Composite Structures

1:50 Lapoujade, V., Alliance Services Plus,
A Study of Mapping Technique for Air Blast Modeling

2:15 McLean, J.G., State University of New York at Geneseo,
Simulation of Granular Ceramic Armor Under Impact from Bullets

2:40 Mossakovsky, P.A., Moscow State University,
Investigation of the Shear Thickening Fluid Dynamic Properties and its Influence on the Impact
Resistance of Multilayered Fabric Composite Barrier

3:05 p.m. Coffee Break – Sponsored by Penguin Computing Great Lakes Center
3:25 p.m.  Session 6  –  Fluid / FSI  Desoto Ballroom

Session Chair:  Mohammad Usman (Ford Motor Company)

3:25  Del Pin, F., Livermore Software Technology Corporation,
      Advances on the Incompressible CFD Solver in LS-DYNA®

3:50  Ghorbanie, M., AMEC Americas,
      Structure-Fluid Interaction Analysis of an Existing Water Tank

4:15  Zhang, Z.C., Livermore Software Technology Corporation,
      How to Use the New CESE Compressible Fluid Solver in LS-DYNA®

4:40  Im, K.S., Livermore Software Technology Corporation,
      Module Development of Multiphase and Chemically Reacting Flow in LS-DYNA®
      Compressible Flow Solver

5:05  Seguro, J.V., The Procter & Gamble Co.,
      Fluid Structure Interaction (FSI) Applications to Consumer Products

5:30  Souli, M., University of Lille,
      ALE Incompressible Fluid in LS-DYNA®

3:25 p.m.  Session 7  –  Occupant Safety  Marquis Ballroom

Session Chair:  Wenyu Lian (General Motors Company)

3:25  Shah, C.S., First Technology Safety Systems,
      A New Development in Pedestrian Safety: The FLEX-PLI GTR LS-DYNA® Model

3:50  Malcolm, S., Honda R&D Americas, Inc.,
      Side Impact Occupant Modeling Practices in Comparison to Test Results

4:15  Stahlschmidt, S., DYNAmore GmbH,
      WorldSID 50th vs. ES-2: A Comparison Based on Simulations

4:40  Maurath, C., Livermore Software Technology Corporation,
      Overview of LSTC’s LS-DYNA® Anthropomorphic Models

5:05  Mohan, P., NCAC, The George Washington University,
      LSTC / NCAC Dummy Model Development

5:30  Canadas, C., LMS International,
      An Integrated Process for Occupant Safety Simulations with LS-DYNA® & MADYMO Coupling
3:25 p.m.  Session 8 – Computing Technology  

Pierce Arrow Suite

Session Chair: Alex Akkerman (Ford Motor Company)

3:25  Posey, S., NVIDIA,  
      Performance Benefits of NVIDIA GPUs for LS-DYNA®

3:50  Grimes, R., Livermore Software Technology Corporation,  
      The Potential Impact of GPUs on LS-DYNA® Implicit

4:15  Schreiber, O., SGI,  
      LS-DYNA® on Advanced SGI® Architectures

4:40  Lin, Y.Y., Hewlett-Packard Company,  
      A Study on the Scalability of Hybrid LS-DYNA® on Multicore Architectures

5:05  Meng, N., Intel Corporation,  
      New Features in LS-DYNA® HYBRID Version

5:30  Shainer, G., HPC Advisory Council,  
      LS-DYNA® Best-Practices: Networking, MPI and Parallel File System Effect on LS-DYNA® Performance

3:25 p.m.  Session 9 – Simulation (3)  

Rolls Royce Suite

Session Chair: John D. Reid (University of Nebraska – Lincoln)

3:25  Blanco, D.H., Dainese S.p.a.,  
      FE Modeling of Innovative Helmet Liners

3:50  Syma, A., Black & Decker GmbH,  
      Usage of LS-DYNA® in the Development of Professional Hammer Drills

4:15  DePolo, D., US Army Corps of Engineers,  
      The Use of LS-DYNA® Models to Predict Containment of Disk Burst Fragments

4:40  Carney, K., NASA Glenn Research Center,  
      Modeling the Effects of Laser Peening on Friction Stir Welding Residual Stresses

5:05  Huang, Y., Livermore Software Technology Corporation,  
      Mode-based Frequency Response Function and Steady State Dynamics in LS-DYNA®
3:25 p.m.  Session 10 – Metal Forming  Stearns Knight Suite

Session Chair: Changqing Du (Chrysler Group, LLC)

3:25  Ren, F., Ford Motor Company,
Process Modeling of Freeform Incremental Forming Using LS-DYNA®

3:50  Hu, W., Livermore Software Technology Corporation,
LS-DYNA® Meshfree Interactive Adaptivity and Its Application

4:15  Shang, J., American Trim LLC,
Numerical Simulation and Experimental Study of Electromagnetic Forming

4:40  Lu, H., Shanghai Hengstar Technology Co. Ltd.,
An Improved 3D Adaptive EFG Method for Forging and Extrusion Analysis with Thermal Coupling in LS-DYNA®

5:05  L’Eplattenier, P., Livermore Software Technology Corporation,
An MPP Version of the Electromagnetism Module in LS-DYNA® for 3D Coupled Mechanical-Thermal-Electromagnetic Simulations

5:30  Sözen, L., TOBB University of Economics and Technology,
Prediction of Springback in CNC Tube Bending Process Based on Forming Parameters

7:00 p.m. – 9:00 p.m.  Conference Banquet – Sponsored by Microsoft
Entertainment – Sponsored by LSTC
Great Lakes Center
Tuesday June 8th

7:30 a.m. – 8:20 a.m.  Continental Breakfast *Sponsored by SGI*  
7:30 a.m.  Registration  
8:00 a.m. – 5:00 p.m.  Exhibition

8:25 a.m.  **Session 11  –  Simulation (4)**  
Desoto Ballroom

**Session Chair: Ligong Pan (Ford Motor Company)**

8:25  *Stolle, C.S., University of Nebraska-Lincoln,*  
Modeling Wire Rope Used in Cable Barrier Systems

8:50  *Sheikh, N.M., Texas Transportation Institute,*  
Finite Element Modeling and Validation of Guardrail Steel Post Deflecting in Soil  
At Varying Embedment Depths

Meshfree Analysis Using the Generalized Meshfree (GMF) Approximation

9:40  *Narkhede, S., Tata Technologies Ltd.,*  
Bolted Joint Representation in LS-DYNA® to Model Bolt Pre-Stress and Bolt Failure  
Characteristics in Crash Simulations

8:25 a.m.  **Session 12  –  Automotive (2)**  
Marquis Ballroom

**Session Chair: Tau Tyan (Ford Motor Company)**

8:25  *Wood, P.K.C., University of Warwick,*  
A Smoothed-Particle Hydrodynamics (SPH) Model for Machining of 1100 Aluminum

8:50  *Shkolnikov, M.B.,*  
Vehicle Structures Experimental Analyses

9:15  *Rorris, L., BETA CAE Systems SA,*  
Latest Developments in Crash Pre Processing and Post Processing – Innovative Ideas Brought  
to the Industry

9:40  *Chickmenahalli, A., International Automotive Components,*  
Innovative Impact Absorbing Countermeasure for Door Side Impact

8:25 a.m.  **Session 13  –  Crash Safety**  
Pierce Arrow Suite

**Session Chair: Chin-Hsu Lin (General Motors Company)**

8:25  *Janapala, N.R., Stanford University,*  
Crashworthiness of Composite Structures with Various Fiber Architectures

8:50  *Haufe, A., DYNAmore GmbH,*  
Comparison of Recent Damage and Failure Models for Steel Materials in Crashworthiness  
Applications in LS-DYNA®
Tuesday June 8th

9:15  Kosaka, I., Vanderplaats R&D Inc.,
Improvement of Energy Absorption for the Side Member Using Topography Optimization

9:40  Cerit, M.E., TOBB University of Economics and Technology,
Improvement of the Energy Absorption Capacity of an Intercity Coach for Frontal Crash Accidents

8:25 a.m.  Session 14 – Optimization (1)  Rolls Royce Suite

Session Chair: Larsgunnar Nilsson (Engineering Research Nordic AB)

8:25  Roux, W., Livermore Software Technology Corporation,
LS-OPT®/Topology Version 1

8:50  Stander, N., Livermore Software Technology Corporation,
An Overview of LS-OPT® Version 4.1

9:15  Goel, T., Livermore Software Technology Corporation,
Variable Screening Using Global Sensitivity Analysis

9:40  Witowski, K., DYNAmore GmbH,
Capabilities of Result Visualization in LS-OPT® V4.1 - Demonstrated by Means of Industrial Problems

8:25 a.m.  Session 15 – Metal Stamping  Stearns Knight Suite

Session Chair: Cedric Xia (Ford Motor Company)

8:25  Kato, Y., JSOL Corporation,
Recent Developments in JSTAMP/NV for the Best Stamping Simulation Environment

8:50  Li, K., Chrysler Group LLC,
A Simple, Efficient and Robust Way to do Binder Wrap Simulation with LS-DYNA® Implicit Solver

9:15  Wiegand, K., Daimler AG,
Developments in Line-Die Simulation and Exterior Surface Quality Check

9:40  Zhu, X., Livermore Software Technology Corporation,
Advancements in Material Modeling and Implicit Method for Metal Stamping Applications

10:05 a.m.  Coffee Break – Sponsored by Beta CAE  Great Lakes Center
**10:25 a.m.  Session 16  –  Aerospace (2)  Desoto Ballroom**

**Session Chair:  Sunil Sinha (GE Infra Aviation US)**

10:25  *Annett, M.S., NASA Langley Research Center,*
LS-DYNA® Analysis of a Full-Scale Helicopter Crash Test

10:50  *Shi, Y., Engineered Arresting Systems Corporation,*
EMAS Core Material Modeling with LS-DYNA®

11:15  *Barsotti, M., Protection Engineering Consultants, LLC,*
Comparison of FEM and SPH for Modeling a Crushable Foam Aircraft Arrestor Bed

11:40  *Polanco, M., ATK Space Systems,*
Use of LS-DYNA® to Assess the Energy Absorption Performance of a Shell-Based Kevlar™/Epoxy Composite Honeycomb

12:05  *Jackson, K.E., NASA Langley Research Center,*
Predicting the Dynamic Crushing Response of a Composite Honeycomb Energy Absorber Using Solid-Element-Based Models in LS-DYNA®

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**10:25 a.m.  Session 17  –  Optimization (2)  Marquis Ballroom**

**Session Chair:  R.J. Yang (Ford Motor Company)**

10:25  *Sharma, N., Detroit Engineered Products Inc.,*
Multi-Disciplinary Optimization of a Sedan Using Size and Shape Parameterization

10:50  *Bojanowski, C., Argonne National Laboratory,*
Safety Assessment and Multi-Objective Optimization of a Paratransit Bus Structure

11:15  *Nilsson, L., Engineering Research Nordic AB,*
A New Method for the Structural Optimization of Product Families

11:40  *Cooper, J., Denton ATD, Inc.,*
Optimization Techniques in Conjunction with Complex ATD FE Models Using LS-DYNA®

12:05  *Müllerschön, H., DYNAmore GmbH,*
Application of Topology Optimization for Crash with LS-OPT®/Topology

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**10:25 a.m.  Session 18  –  Automotive (3)  Pierce Arrow Suite**

**Session Chair:  Ye-Chen Pan (General Motors Company)**

10:25  *Yang, S., IMMI,*
Investigations of Generalized Joint Stiffness Model in LSTC Hybrid III Rigid-FE Dummies

10:50  *Thole, C.A., Schloß Birlinghoven,*
Advanced Mode Analysis for Crash Simulation Results

11:15  *Liu, Y., University of Louisiana,*
Crashworthiness Analysis of Finite Element Truck Chassis Model Using LS-DYNA®
11:40 Teng, H., Livermore Software Technology Corporation,
The Recent Progress and Potential Applications of Corpuscular Method in LS-DYNA®

12:05 Kondo, K., Fujitsu Limited,
The Performance of Car Crash Simulation by LS-DYNA® Hybrid Parallel Version on Fujitsu FX1

10:25 a.m. Session 19 – Simulation (5) Rolls Royce Suite
Session Chair: Chris Galbraith (MFAC)
10:25 Vézina, M., SimuTech Group Inc.,
Drop Test into Water and Wave Impact Simulations of a Novel 7-Meter Plastic Boat with LS-DYNA®

10:50 D'Amours, G., National Research Council Canada,
Heat Transfer Simulation to Determine the Impact of Al-5Mg Arc Sprayed Coating onto 7075 T6 Al Alloy Fatigue Performance

11:15 Tutt, B., Airborne Systems,
Development of Parachute Simulation Techniques in LS-DYNA®

11:40 Ensan, M.N., National Research Council Canada,
Response of the Enhanced Polar Outflow Probe (e-POP) Instrument Under Shock Loading

12:05 Abramov, A.V., STRELA,
Mathematical Modeling of Asteroid Falling into the Ocean

10:25 a.m. Session 20 – Blast / Impact (2) Stearns Knight Suite
Session Chair: Mohamed S. Hamid (Delphi Corporation)
10:25 Chen, M.M., U.S. Army Research Laboratory,
High Fidelity In-Bore Pressure Modeling

10:50 Song, G., Wayne State University,
Vehicle and Occupant Safety Protection CAE Simulation

11:15 Ibrahim, A., University of Missouri,
Numerical Prediction of the Dynamic Response of Prestressed Concrete Box Girder Bridges Under Blast Loads

11:40 Ward, E., The Johns Hopkins University, APL,
Applying the Dynamic Relaxation Step to Determine Influence on Global Model Response from Shock Tube Loading for Mounted Hybrid III Head Neck Assembly

12:30 p.m. Lunch Great Lakes Center
Tuesday June 8th

1:45 p.m.  Plenary Session -- Technology Today  Great Lakes Center
1:45  Engineering Technology Associates, Inc.
1:55  FEA Information, Inc.
2:05  SGI
2:15  ARUP
2:25  Beta CAE Systems S.A.
2:35  d3View®
2:45  Penguin Computing Inc.

3:00 p.m.  Coffee Break – Sponsored by d3View  Great Lakes Center

3:15 p.m.  Conference Prize Drawing  Great Lakes Center

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

John O. Hallquist  “LS-DYNA® Recent Developments”
President, LSTC

Closing Remarks: Wayne L. Mindle, LSTC

Thank you for your participation!
Some classes have room for additional students. Please inquire at Registration (Regency J) for availability and payment. In order to have manual printed, please sign up by 5 p.m. on Monday, June 7th.