9th International LS-DYNA® Users Conference

June 4- 6, 2006
Hyatt Regency Dearborn
Dearborn, Michigan USA

Sunday June 4th

12:30 p.m. - 4:00 p.m.	**Rouge Factory Tour**	
5:00 p.m. - 6:00 p.m.	**Registration** *"Sponsored by Fujitsu"*	**Great Lakes Center**
6:00 p.m. - 8:00 p.m.	**Welcome Reception** *"Sponsored by Microsoft"*	**Great Lakes Center**
5:00 p.m. - 8:00 p.m.	**Exhibition**	**Great Lakes Center**

Monday June 5th

7:30 a.m. – 4:00 p.m.	Registration *"Sponsored by Fujitsu"*	**Great Lakes Center**
7:30 a.m. – 8:20 p.m.	Continental Breakfast *"Sponsored by Sun Microsystems"*	**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.   Keynote Presentations   **Great Lakes Center**

Session Chair: John O. Hallquist (LSTC)

9:20 **Dr. Ted Belytschko**   *"Trends in Nonlinear Simulation"*
Walter P. Murphy Professor
Northwestern University

8:35 **Mr. James W. Welton**   *"LS-DYNA at GM – Current & Future"*
Director
Global CAE Development and Integration
General Motors Corporation

10:05 a.m.   *Coffee Break – "Sponsored by PathScale"*   **Great Lakes Center**

10:20 **Kwan-Hum Park**   *"Virtual Vehicle Development in HMC"*
Director
Hyundai Motor Company

11:00 **Paul Du Bois**   *"A Constitutive Formulation for Polymers Subjected to High Strain Rates"*
Consulting Engineer

12:00 p.m.   *Lunch – "Sponsored by HP"*   **Great Lakes Center**

1:00 p.m.   Session 1 -- Crash / Safety (1)   **Marquis Ballroom**

Session Chair: TBA

1:00 *Abu-Odeh, A.*
   Application of New Concrete Model to Roadside Safety Barriers

1:25 *Tryland, T.*
   Alternative Models of the Offset and Side Impact Deformable Barriers

1:50 *Walker, B.*
   A New Generation of Crash Barrier Models for LS-DYNA

2:15 *Gupta, R.*
   Nonlinear Crash Dynamics Simulation of Novel Airbag Based Next Generation Energy Absorbing Barrier

2:40 *Sheikh, N.M.*
   Development of an Energy Absorbing End Terminal for Open Box Beam Guardrail

1:00 p.m.   Session 2 -- Penetration / Explosive Modeling   **Stanley Steamer Suite**

Session Chair: TBA

1:00 *Schwer, L.E.*
   Perforation of Metal Plates: Laboratory Experiments and Numerical Simulations

1:25 *Chen, M.M.*
   Structural Design and Analysis of Hit-To-Kill Projectile

1:50 *Hinrichsen, R.L.*
   High Velocity Impacts of Man Portable Air Defense Systems (MANPADS) on Selected Targets

2:15 *Fox, D.M.*
   Development, Optimization and Design for Robustness of a Novel FMVSS 201U Energy Absorber

2:40 *Raguraman, M.*
   Accurate Prediction of Projectile Residual Velocity for Impact on Single and Multi-Layered Steel and Aluminum Plates

1:00 p.m.   Session 3 -- Simulation Technolgy (1)   **Desoto**

Session Chair: John Reid (University of Nebraska-Lincoln)

1:00 *Wu, J.*
Advanced Modeling and Drop Simulation With New Features of LS-DYNA

1:25 *Shkolnikov, M.B.*
Thin-Walled Beams Research and Development

1:50 *Bhargava, A.,*
Analysis of Extended End-Plate Connections Under Cyclic Loading Using the LS-DYNA Implicit Solver

2:15 *Han, H.,*
Comparison of LS-DYNA and NISA in Solving Dynamic Pulse Buckling Problems in Laminated Composite Beams

2:40 *Song, G.G.*
CAE Correlation with Test for Door Slam in Nonlinear Dynamic Stress and Fatigue Life Analysis

1:00 p.m.   Session 4 -- Impact Analysis (1)   **Pierce Arrow Suite**

Session Chair: TBA

1:00 *Shahkarami, A.*
An Efficient Shell Element Based Approach to Modeling the Impact Response of Fabrics

1:25 *Cheng, J.*
A Numerical Model for Tri-Axially Braided Composites Under High Velocity Soft Projectile Impact

1:50 *Zheng, D.*
Numerical Modeling of Friction Effects on the Ballistic Impact Response of Single-Ply Tri-Axial Braided Fabric

2:15 *Xin, X*
A New Way for Multi-piece and Multi-hit Fragment Impact Simulation Using LS-DYNA

2:40 *Deka, L.J.*
Damage Evaluation and Energy Absorption of FRP Plates Subjected to Ballistic Impact Using a Numerical Model

1:00 p.m. Session 5 -- Computing / Code Technology (1)   **Stearns Knight Suite**

Session Chair: TBA

1:00 *Makino, M.*
The Performance of Large Car Model by MPP Version of LS-DYNA on Fujitsu PrimePower

1:25 *Dunlap, D.*
Using Platform LSF to Harness Non-Dedicated Computational Resources for LS-DYNA Crash Simulations at DaimlerChrysler

1:50 *Burke, M.*
LS-DYNA® Performance and Scalability on Sun(TM) x64 Systems

2:15 *Lin, Y.Y.*
The Advantages of HP-MPI for MPP LS-DYNA

3:05 p.m.   **Coffee Break –** *"Sponsored by PathScale"*   **Great Lakes Center**

3:20 p.m.   Session 6 -- Crash / Safety (2)   **Marquis Ballroom**

Session Chair: TBA

3:20 *Untariou, C.*
Development and Validation of a Headform Impactor Finite Element Model with Application to Vehicle Hood Design for Pedestrian Protection

3:45 *Hamid, M.S.*
Systems Engineering Approach in Development of Delphi Driver Protection Module (DDPM) by Virtual Engineering

4:10 *Wang, Q.*
A Numerical Investigation into the Injury Potential of Three-year-old Children Seated in Forward Facing Child Safety Seats During Side Impact Crashes in Far Side Configurations

4:35 *Stahlschmidt, S.*
BioRID II Dummy Model Development - Influence of Parameters in Validation and Consumer Tests

3:20 p.m.   Session 7 -- Opitmization   **Stanley Steamer Suite**

Session Chair: TBA

3:20 *McLundie, B.*
    Pedestrian Hood Generation & Optimization Using Knowledge-Based Engineering

3:45 *Stander, N.*
    New Features in LS-OPT$^®$ Version 3

4:10 *Magistrali, S.*
    **Calibration and Experimental Validation of LS-DYNA Composite Material Models by Multi
    Objective Optimization Techniques**

4:35 *Keer, T.*
    **An Assessment of the Robustness of the European Pedestrian Leg Impact Test Using LS-OPT and
    LS-DYNA**

5:00 *Seo, S.Y.*
    A Study on a Multi-Disciplinary Optimization Method for the PMP

5:25 *Thiele. M.*
    **Opitmization of and Adaptive Restraint System Using LS-OPT and Visual Exploration of the
    Design Space Using D-SPEX**

3:20 p.m.   Session 8 -- Simulation Technology (2)   **Desoto**

Session Chair: TBA

3:20 *Siebert, A.*
    **Investigating the Vibration Behavior and Sound of Church Bells Considering Ornaments and
    Reliefs Using LS-DYNA**

3:45 *Grytten, F.*
    On the Qausi-Static Perforation Resistance of Circular AA5083-H116 Aluminium Plates

4:10 *Hua, J.*
    Process Modeling of Piercing Micro-hole with High Pressure Water Beam

4:35 *Sinha, K.*
    A Simulation-Driven System Design Methodology with Manufacturing Constraints

5:00 *Rentschler, M.*
    LS-DYNA Simulation of *in vivo* Surgical Robot Mobility

5:25 *Shoukry, S.N.*
    **Application of Dynamic Relaxation in Thermo-Elastic Structural Analysis of Highway Pavement
    Structures**

3:20 p.m. Session 9 -- Impact Analysis (2)   **Pierce Arrow Suite**

Session Chair: TBA

3:20 *Jackson, K.E.*
A Mesh Refinement Study on the Impact Response of a Shuttle Leading-Edge Panel Finite Element Simulation

3:45 *Raftenberg, M.N.*
A Brittle Damage Model: Implementation into LS-DYNA and Application to Normal Plate-on-Plate Impact

4:10 *Yashin, A.*
Design and Finite Element Analysis of Type C Shipping Cask for International Licensing

3:20 *Kirkpatrick, S.W.*
Modeling Methodologies for Assessment of Aircraft Impact Damage to the World Trade Center Towers

3:20 p.m. Session 10 -- Code / Technology (2)   **Stearns Knight Suite**

Session Chair: TBA

3:20 *Posey, S.*
Considerations for LS-DYNA Workflow Efficiencies in an HPC Linux Environment

3:45 *Prince, T.*
LS-DYNA[®] Performance on 64-Bit Intel[®] Xeon[®] Processor-Based Clusters

4:10 *Rustagi, P.*
Projecting Performance of LS-DYNA Implicit for Large Multiprocessor Systems

7:00 p.m. – 9:00 p.m.   **Conference Banquet – *"Sponsored by Intel and SGI"***   **Great Lakes Center**

7:30 a.m. – 8:20 a.m.	Continental Breakfast *"Sponsored by AMD"*	Great Lakes Center
7:30 a.m.	Registration *"Sponsored by Fujitsu"*	Great Lakes Center
8:00 a.m. – 4:00 p.m.	Exhibition	Great Lakes Center

8:25 a.m.   Session 11 -- Crash / Safety (3)   **Marquis Ballroom**

Session Chair: TBA

8:25 *Nutwell, E.*
Material Model Development for Impact Strength Validation of a Composite Truck Bed Design

8:50 *Thole, C.A.*
Scatter Analysis of Crash Simulation Results Enabled by Data Compression

9:15 *Elitok ,K.*
An Investigation on the Roll-Over Crashworthiness of an Intercity Coach, Influence of Seat Structure and Passenger Weight

9:40 *Shetty, S.H.*
Productive Environment for Quick CAE Modeling and Simulation – Visual Environment

8:25 a.m.   Session 12 -- Metal Forming (1)   **Stanley Steamer Suite**

Session Chair: TBA

8:25 *Li, K.*
MPP in Stamping Simulations with LS-DYNA

8:50 *Tang, A.*
The Evolution of Sheet Metal Forming Simulation in Stamping Industry

9:15 *Ren, F.*
Prediction of Impact Marks for a Stamped Panel with LS-DYNA

9:40 *Shapiro, A.B.*
LS-DYNA Features for Hot Stamping

8:25 a.m.   Session 13 -- Simulation Technology (3)   **Desoto**

Session Chair: TBA

8:25 *Fyllingen, Ø.*
Simulations of Axially Loaded Straight Aluminium Profiles with Random Geometric Imperfections

8:50 *Xue, L.*
Verification of a New Fracture Criterion Using LS-DYNA

9:15 *Petrushina, M.*
Thermomechanical Analysis of the Turbo-Compressor Sliding Bearing Mount Units

9:40 *Pan, F.*
Three Point Bending Analysis of a Mobile Phone Using LS-DYNA Explicit Integration Method

8:25 a.m.   Session 14 -- Impact Analysis (3)   **Pierce Arrow Suite**

Session Chair: TBA

8:25 *Yang, H.M.*
Process Automation for LS-DYNA Based Shock and Impact Studies (Drop Testing) in eta/VPG Environment

8:50 *Borovkov, A.*
Finite Element Modeling and Analysis of Crash Safe Composite Lighting Columns, Contact-Impact Problem

9:15 *Yaksh, M.*
Evaluation of the Impact Condition for a High Capacity Spent Nuclear Fuel System

9:40 *Fasanella, E.L.*
Test and Analysis Correlation of High Speed Impacts of Ice Cylinders

8:25 a.m.   Session 15 -- Material Modeling (1)   **Stearns Knight Suite**

Session Chair: TBA

8:25 *Carney, K.S.*
A High Strain Rate Model with Failure for Ice in LS-DYNA

8:50 *Bergström, J.S.*
Development and Implementation of an Advanced User Material Model for UHMWPE

9:15 *Benson, D.J.*
A Simplified Approach for Strain-Rate Dependent Hyperelastic Materials with Damage

9:40 *Donadon, M.V.*
A Constitutive Formulation for Polymers Subjected to High Strain Rates

10:05 a.m.   Coffee Break – *"Sponsored by PathScale*   Great Lakes Center

10:25 a.m. Session 16 -- Crash / Safety (4)   **Marquis Ballroom**

Session Chair: TBA

10:25 *Wang, H.P.*
   Crashworthiness Simulation Using Coupled Meshfree/Finite Element Formulations in LS-DYNA

10:50 *Heydari, C.*
   Flexible Body Suspension System Modeling and Simulation Using MD/NASTRAN SOL700 in VPG Environment

11:15 *Wood, P.K.C.*
   Validating Performance of Automotive Materials at High Strain Rate for Improved Crash Design

11:40 *McGregor, C.*
   Simulation of Progressive Damage Development in Braided Composite Tubes Undergoing Axial Crushing

10:25 a.m. Session 17 -- Metal Forming (2)   **Stanley Steamer Suite**

Session Chair: TBA

10:25 *L'Eplattenier, P.*
   Introduction of an Electromagnetism Module in LS-DYNA for Coupled Mechanical-Thermal-Electromagnetic Simulations

10:50 *Lim, T.*
   Springback Predictions of the Numisheet 2005 Benchmark II Using DP600: The Effect of Using 21 Through Thickness Integration Points and Using a Static Implicit Finish to the Forming Simulation

11:15 *Kuldiwar, A.A.*
   Finite Element Modeling of Strip Curvature During Hot Rolling

11:40 *Lu, H.S.*
   A Grid-based Adaptive Scheme for the Three-Dimensional Forging and Extrusion Problems with the EFG Method

10:25 a.m. Session 18 -- Simulation Technology (4)   **Desoto**

Session Chair: TBA

10:25 *Kojima, S.*
   Development of Aluminum Honeycomb Model Using Shell Elements

10:50 *Borrvall, T.*
   A User-Defined Element Interface in LS-DYNA v971

11:15 *Tho, C.H.*
   Bird Strike Simulation for BA609 Spinner and Rotor Controls

11:40 *Akarca, S.S.*
   A Coupled Thermal and Mechanical Model of Sliding Wear

12:05 *Neumayer, D.*
   Drop Test Simulation of a Cooker Including Foam Packaging and Pre-stressed Plastic Foil Wrapping

10:25 a.m.   Session 19 -- Fluid / Structure   **Pierce Arrow Suite**

Session Chair: TBA

10:25   *Tutt, B.*
The Application of a New Material Porosity Algorithm for Parachute Analysis

10:50   *Zhang, N.*
Issues on Gas-Fabric Interaction in Airbag Simulation Using LS-DYNA ALE

11:15   *Zhang, Z.C.*
The New CE/SE Fluid Solver and Fluid/Structure Coupling

11:40   *Del Pin, F.*
Fluid Structure Interaction in LS-DYNA Using Lagrangian Interfaces, Automatic Re-meshing and Adaptivity

12:05   *Wang, J.*
Porous Euler-Lagrange Coupling: Application to Parachute Dynamics

10:25 a.m.   Session 20 -- Material Modeling (2)   **Stearns Knight Suite**

Session Chair: TBA

10:25   *Heimbs, S.*
Honeycomb Sandwich Material Modeling for Dynamic Simulations of Aircraft Interior Components

10:50   *Berstad, T.*
Implementation of Constitutive Model for Thermoplastics with Some Preliminary Results

11:15   *Murray, Y.D.*
Mixed Mode Constitutive Driver

11:40   *Yoon, J.W.*
Implementations of User Defined Shell Elements and Material Models to LS-DYNA and Their Application

12:05   *Lobo, H.*
Advances in the Measurement and Modeling of Plastics for Impact Simulations

12:30 p.m.   **Lunch –** *"Sponsored by Penguin Computing"*   **Great Lakes Center**

1:30 p.m.   Common Session -- Computing Infrastructure   Great Lakes Center

Session Chair: TBA

        Sun Microsystems
        Penguin Computing
        PathScale
        Fujitsu
        AMD
        HP
        Microsoft
        ETA
        SGI
        Intel

3:45 p.m.   *Coffee Break – "Sponsored by PathScale"*   **Dearborn Ballroom**

4:00 p.m.   Keynote Presentation   Springwells Ballroom

Session Chair: TBA

      John O. Hallquist, President, LSTC   **"*LS-DYNA Development*"**

Closing Remarks: Wayne L. Mindle, LSTC

Thank you for your participation in the 9th International LS-DYNA Users Conference!

Post-Conference Training Seminars
June 7th & 8th
(Seminars are conducted at the University of Michigan-Dearborn)
9:00 a.m. – 5:00 p.m.
(Lunch is provided)

Advanced Crashworthiness	*Paul A. Du Bois*
ALE/Eulerian Fluid/Structure Interaction	*M'hamed Souli, Ph.D.*
Heat Transfer Analysis	*Arthur Shapiro, Ph.D.*
Implicit Analysis	*Ala Tabiei, Ph.D.*
LS-OPT®	*Nielen Stander, Ph.D.*
LS-PrePost®	*Philip Ho*
Metal Forming	*Xinhai Zhu, Ph.D.*

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