WEDNESDAY, March 31, 2010

8:00-8:30  Continental Breakfast

8:30-8:35  Welcome and Introductions  
**Pradeep Lall, Thomas Walter Professor and Center Director, Mechanical Engineering**

8:35-8:45  NSF Comments

8:45-9:45  Center Overview & Status  
**Pradeep Lall, Thomas Walter Professor and Center Director, Mechanical Engineering**

9:45-10:00  Break

10:00-11:45  **Chip-Level Interconnects, Flip-Chip and Underfills**  
*Area Leader: Jeff Suhling, Mechanical Engineering*

- **P07-201**  Harsh Environment Reliability of Underfilled Area Array Flip Chip Devices
- **P09-201**  Characterization and Modeling of Advanced Substrates
- **P08-201**  Models for Underfill Stress-Strain and Failure Behavior with Aging Effects
- **P07-203**  Die Stresses and Failure Progression in Microprocessor Packaging (LGA)
- **P09-202**  In situ Die Stress Measurements in Flip Chip Packaging
- **P08-202**  Modeling and Material Characterization for Flip Chip Packaging

11:45-12:00  Break

12:00-1:15  Lunch, Auburn University Hotel & Conference Center, Governor’s Room

1:15-3:00  **Component Reliability and Prognostic Health Management Systems**  
*Area Leader: Pradeep Lall, Mechanical Engineering*

- **P09-101**  Leadfree Part Reliability, Crack Propagation and Life Prediction under Extreme Environments
P09-102  PHM for Field-Deployed Electronics Subjected to Multiple Thermal Environments
P09-103  Development of Acceleration Factors and Closed-Form Life Prediction Models for Leadfree Packaging
P09-104  Virtual Qualification of Leadfree Area-Array and Perimeter Packaging
P09-105  Reliability Models for Interconnects and Interfaces in Leadfree Electronics subjected to Shock and Vibration

3:00-3:15  Break

3:15-5:00  **Connectors, and System-Level Interconnects: Degradation and Wear Mechanisms**
*Area Leader: George Flowers, Mechanical Engineering*

P08-403  Theoretical and Experimental Investigation on Fretting Corrosion and Thermal Degradation for Hybrid and Electric Vehicles
P08-404  Compliant Pin/Press Fit Technology
P08-405  Modeling and Analysis of a Connector System for Vibration-induced Fretting Corrosion
P08-409  Vibration Based Interfaces for Information Transmission
P09-401  Sn Whisker Growth from Sputtered SAC 305 Film on Brass
P09-402  Mitigation of Sn Whisker Growth Using a Ni Underlayer
P09-403  Whisker Growth During Exposure to Controlled Humidity
P09-404  Sn Whiskers Formed in Electric Fields

5:00-5:15  Break

5:15-6:15  Project Posters and Demonstrations

*Posters: Component Reliability and Prognostic Health Management Systems*
*Area Leader: Pradeep Lall, Mechanical Engineering*

PCR and Ridge Regression Based Development of Norris- Landzberg Acceleration Factors and Goldmann’s Constants for Lead free Electronics
- *Dinesh Arunachalam (ME)*
Assessment of PHM Algorithm Robustness for Electronics Applications
- *Ryan Lowe (ME)*
Prognostic Health Management eTool
- *Ryan Lowe (ME)*,
Join Discussion on the CAVE³ Blog
- *Ryan Lowe (ME)*
Decision Framework for Redeployment of Electronics in Multiple Envts based on Damage Pre-Cursors  
- **Rahul Vaidya (ME), Vikrant More (ME)**

Vibration Testing of Ceramic Area-Array Micro-Coil Springs  
- **Dhananjay Panchagade (ME)**

Board Trace Fatigue Models  
- **Arjun Angral**

CAVE³ Online Simulation Tools  
- **Aravind Sridhar (ME)**

Thermo-Mechanical Reliability Data of Low-Silver Leadfree Alloys  
- **Mahendra Harsha (ME), Robert Hinshaw (ME)**

Thermo-mechanical Reliability and Thermal Performance of HEV Metal-Matrix System  
- **Mahendra Harsha (ME)**

Prediction of Transient Dynamics Interface Damage for SnAgCu Leadfree Electronics under Shock-Impact  
- **Mandar Kulkarni (ME)**

Life-Prediction Models for SnAgCu Leadfree Electronics under Shock-Impact  
- **Sandeep Shantaram (ME)**

Acceleration Factors and Life Prediction Models for on-chip and off-chip Failure Mechanisms  
- **Dinesh Arunachalam (ME), Prathap Subramaniam (CSE)**

Prognostics Framework to Assess Operational Readiness of BGA’s For Re-Deployment in Thermo-Mechanical Environments  
- **Mahendra Harsha**

Study of Crack Initiation and Propagation in Leadfree packages Under Multiple Thermal Environments  
- **Mahendra Harsha (ME)**

Anomaly Detection in Electronic Systems Subjected to Drop and Shock  
- **Prashant Gupta (ME)**

**Posters: Chip-Level Interconnects, Flip-Chip and Underfills**

*Area Leader: Jeff Suhling, Mechanical Engineering*

Creep Characterization and Modeling of Underfills for Microprocessor Packaging  
- **Nusrat J. Chhanda (ME)**

Test Plan for Flip Chip on Laminate Die Stress Study  
- **Safina Hussain (ME)**

Determination of Stress Measurement Accuracy With Piezoresistive Sensors  
- **Safina Hussain (ME), Mohammad Motalab (ME), Jordan Roberts (ME)**

Isothermal Aging Effects on Underfill Creep Behavior  
- **Chang Lin (ME)**

Isothermal Aging Effects on Underfill Stress-Strain Behavior
- Chang Lin (ME)
  Effects of Heat Sink Clamping on Changes in The Microprocessor Die Stress
- Jordan Roberts (ME)
  Die Stress Variation in Microprocessor Packaging Subjected to Long Term Thermal Cycling
- Jordan Roberts (ME)
  Temperature Dependent Die Stresses in Microprocessor Packaging
- Jordan Roberts (ME), Safina Hussain (ME)
  Development of Lamination Theory for STABLCOR Substrates
- Kun-Yen Wang (ME)
  FEA Predictions of Assembly Induced Die Stresses in Microprocessor Packaging
- Mohammad Motalab (ME), Jordan Roberts (ME)

Posters: Connectors, and System-Level Interconnects: Degradation and Wear Mechanisms
Area Leader: George Flowers, Mechanical Engineering

Whisker Growth During Exposure to Controlled Humidity
- E. Crandall (Physics)
Sn Whiskers Formed in Electric Fields
- E. Crandall (Physics)
Mitigation of Sn Whisker Growth Using a Nickel Underlayer
- E. Crandall (Physics)
Sn Whisker Growth from Sputtered SAC305 Film on Brass
- E. Crandall (Physics)
Whisker Exoskeletons as Viewed by Real-Time Scanning Electron Microscopy
- E. Crandall (Physics)
Multiphysics/Multiscale Finite Element Model - 40 A Connector
- Santosh Angadi (ME)
Experimental Investigation of High Power Connector Reliability
- Rujian Fu (ME)
Multi-Physics FEM for High Power Connectors
- Robert Polchow (ME)
Vibration Based Interfaces for Information Transmission
- Pregassen Soobramaney (ME)
Simulation and Experimental Study on the Influence of Particulate Contaminants on Vibration-Induced Fretting Corrosion
- Dr. Jinchun Gao (ME)
Combining Thermal and Vibrational Models to Analyze Fretting Corrosion
- Rebecca Ibrahim (ME), George Vallone (ME)

6:30 Dinner (Zazu Restaurant)
THURSDAY, April 1, 2010

8:00-8:15  Continental Breakfast

8:15-8:45  Hybrid Electric Vehicle Systems and Components
Song-Yul Choe, Mechanical Engineering

8:45-9:00  Vehicle Survivability Analysis
David Beale, Mechanical Engineering

9:00-10:30  Harsh Environment Electronics Systems
Area Leader: John Evans, Industrial Systems Engineering

P09-503  QFP Reliability on Powered and Non-powered Thermal Cycle Environment

P10-501  Reliability of aged lead-free solder for temperature accelerated life testing (TV7)

P10-502  Reliability of aged lead-free solder for mechanical accelerated life testing (TV7)

P10-503  Dip flux reliability for micro BGA packages (TV8)

P05-502  Measurement of Thermal Properties of an Epoxy/Alumina Composite

P10-504  Task Complexity Measurement and Video Training for Automated Equipment

P10-505  Design, Processing and Reliability Characterizations of a 3D-WLCSP Packaged Component

10:30-10:45  Break

10:30-12:15  Leadfree Solders Alloys Constitutive and Wetting Behavior
Area Leader: Mike Bozack, Physics

P07-306:  Aging Behavior of Next Generation Pb-Free Alloys

P08-304:  Extreme Low Temperature Behavior of Solders

P08-305:  Composition, Microstructure, and Reliability of Mixed Formulation Solder Joints

P09-303:  100% In-Situ Studies of Mixed Formulation Alloy Wetting

P09-304:  Microstructure Evolution of Mixed Formulation Alloys

12:15-1:30  Lunch, Auburn University Hotel & Conference Center, Governor’s Room

1:30-2:30  Project Posters and Demonstrations

Posters: Harsh Electronics Systems and Manufacturing
Area Leader: John Evans, Industrial Systems Engineering
QFP Reliability on Powered and Non-powered Thermal Cycle Environment
- Fei Xie (ISE)
Reliability of aged lead-free solder for temperature accelerated life testing (TV7)
- Fei Xie (ISE)
Reliability of aged lead-free solder for mechanical accelerated life testing (TV7)
- Fei Xie (ISE)
Dip flux reliability for micro BGA packages (TV8)
- Fei Xie (ISE)
Task Complexity Measurement and Video Training for Automated Equipment
- Vic Uzumeri, John Evans, Richard Sesek, Jerry Davis
Design, Processing and Reliability Characterizations of a 3D-WLCSP Packaged Component
- Zhaozhi Li (ISE)
In-Situ Environmental Testing for Solder Joint Reliability - Alternative Method (update)
- F. Xie (ISE)
Measurement of Thermal Properties of an Epoxy/Alumina Composite
- John F. Maddox (ME)

Posters: Leadfree Solders Alloys Constitutive and Wetting Behavior
Area Leader: Mike Bozack, Physics

Preliminary Study of Aging and Dopants on Mechanical Properties of SAC Solders
- Zijie Cai (ME)
Effect of Aging on Tensile Properties of SACX
- Zijie Cai (ME)
Modeling of SAC Solder Behavior Using the Anand Viscoplastic Model
- Mohammed Motalab (ME)
Initial Study of SAC Cyclic Stress-Strain Behavior and Hysteresis
- Muhanh Mustafa (ME)
Mechanical Characterization of Solders at Cyrogenic Temperatures
- Muhanh Mustafa (ME), Zijie Cai (ME)
Modeling of Stress-Strain Behavior of Lead Free Solders
- Muhanh Mustafa (ME)
The Influence of Aging Conditions On The Mechanical Behavior SAC Solders
Yifei Zhang (ME)
100% In-Situ Studies of Mixed Formulation Solder Wetting
- M. J. Bozack (Physics), E. Crandall (Physics), and Y. Zhang (ME)
Microstructure Evolution of Mixed Formulation Alloys
- M. J. Bozack (Physics), E. Crandall (Physics), and Y. Zhang (ME)
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<td>2:30-2:45</td>
<td>Break</td>
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<td>2:45-3:45</td>
<td>Industrial Advisory Board (IAB) Closed-Session</td>
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<td>3:45-4:45</td>
<td>Feedback Session</td>
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<td>4:45-6:30</td>
<td>Optional Topical Area Meetings (TBD)</td>
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<td>6:30</td>
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