December 4–5, 2007
Manhattan Beach Marriott
Manhattan Beach, California

Tuesday, December 4, 2007

7:00 Registration/Continental Breakfast

8:00 **Welcome and Opening Remarks**
Ronald Lacoe, Workshop Chair, Technical Program Co-Chair, The Aerospace Corporation
Yuan Chen, Technical Program Co-Chair, Jet Propulsion Laboratory

8:25 **Keynote Presentation I**
Qualification Issues and Pitfalls for Advanced Semiconductor Devices in Space
David Sunderland, Boeing Satellite Development Center

Session I: Product Reliability and Qualification
Session Chair: Yuan Chen, Jet Propulsion Laboratory

9:25 Physics and Chemistry of Electronics Degradation (PACE)—A Pathfinder for Re-establishing DoD's Reliability Assessment Capability Using 21st Century Tools
James Theimer, Air Force Research Laboratories, Wright-Patterson AFB

9:50 Break

10:20 Parts, Materials, and Processes for Optimized Reliability
Steve Bryan, General Dynamics

10:45 C-RAM Phase Change Memory—Update on Reliability and Qualification
Ken Hunt, Air Force Research Laboratories, Kirtland AFB

11:10 FPGA Qualification for DoD Space Systems and FPGA Qualification Status Update
Larry Harzstark, The Aerospace Corporation

11:35 Physics-of-Failure Approach to Assessing Product Reliability of Scaled Microelectronics
Mark White, Jet Propulsion Laboratory

12:00 Conference Luncheon

Tuesday, December 4, 2007 (cont.)

Session II: Advanced Packaging Technologies
Session Chair: Ken Hunt, Air Force Research Laboratories, Kirtland AFB

1:30 Packaging Reliability Issues for Extreme Environments
Carissa Tudryn, Jet Propulsion Laboratory

1:55 FPGA Package Assembly Reliability
Reza Ghaffarian, Jet Propulsion Laboratory

Session III: Radiation Effects on Microelectronics
Session Chair: Keith Avery, Micro-RDC

2:20 Effects of Single-Event-Induced Charge Sharing in Sub-100nm CMOS Technologies
Oluwole Amusan, Vanderbilt University

2:55 Break

3:30 Radiation Hardness by Design Demonstration at 90nm
Warren Snapp, Boeing Company

3:55 Radiation Testing, Characterization and Qualification Challenges for Modern Microelectronics Technologies
Lew Cohn, Defense Threat Reduction Agency

4:20 Spacecraft Structural Shielding Mass and the Single Event Effects Environment: A Comparison of Upset Rates Calculated with FLUKA, CREME-96, and Peterson's Figure of Merit with International Space Station Flight Data
Steve Koontz, NASA Johnson Space Center

5:00 Hosted reception on-site

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Wednesday, December 5, 2007

7:30 Registration/Continental Breakfast

8:00 Announcements

8:05 **Keynote Presentation II**
Advanced, Non-Destructive Defect Localization in Microelectronics
Ed Cole, Sandia National Laboratories

Session IV: Failure Analysis/Tin Whiskers
Session Chair: Donna Speckman, The Aerospace Corporation

9:00 The Importance of Microanalysis in the Aerospace Industry—Techniques and Examples
Gary Stupian, The Aerospace Corporation

9:25 Metal Whiskering: Failure Modes and Mitigation Strategies
Jay Brusse, Perot Systems/NASA Goddard Space Flight Center

9:50 Break

10:20 Understanding Tin Plasmas: A New Approach to Tin Whisker Risk Assessment
Maribeth Mason, The Aerospace Corporation

Session V: Memories
Session Chair: Dave Mavis, Micro-RDC

10:45 Radiation Effects Challenges in 90nm Commercial-Density SRAMs: A Comprehensive SEE and TID Study
Younes Boulghassoul, University of Southern California, Information Sciences Institute

11:10 EEPROM Applications and Risk Mitigations
Yuan Chen, Jet Propulsion Laboratory

11:35 High Reliability Memory Design for Servers Using Low-Cost Commodity Components
Charles Slayman, Sun Microsystems

12:00 Conference Luncheon

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Wednesday, December 5, 2007 (cont.)

Session VI: FPGA Applications
Session Chair: Jon Osborn, The Aerospace Corporation

1:30 SET Characterization and Mitigation of ACTEL Flash-Based FPGAs in Heavy Ions and Protons Beams
Sana Rezgui, Actel

1:55 Determining the Best-Fit FPGA for a Space Mission: An Analysis of Cost, SEU Sensitivity, and Reliability
Melanie Berg, NASA Goddard Space Flight Center

2:20 Effects of Process Scaling on Leading Edge Submicron CMOS Technology
Gary Swift, Xilinx, Inc.

2:45 Break

3:15 Radiation-Hardened by Design Structured ASICs for Reliable Digital Components
Dave Mavis, Micro-RDC

Session VII: Advanced Technologies
Session Chair: Josh Conway, The Aerospace Corporation

3:40 Hybrid CMOS/Nano Crossbar Circuits: From Devices to Applications
Dmitri Strukov, Hewlett Packard Laboratories

4:05 Beating Nyquist Sampling Limits: Signal Extraction Using Compressed Sensing
Peter Petre, Hughes Research Laboratory

4:25 Closing Remarks