

# Material and Package Reliability Needs/Challenges for Harsh Environments



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**ECTC Special Session**

# Material and Package Reliability Needs/Challenges for Harsh Environments - Scope



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- Material needs and package reliability for harsh environment applications for industrial, aerospace and other applications.
- The objective of the panel session would be to showcase and share the views from end customer, tier 1/component supplier, material and university panelists.
- Intent will be to highlight needs and ongoing efforts in this critical area.

# Panelists

- Varughese Mathew, NXP Semiconductors
- Anton Z. Miric, Heraeus Deutschland GmbH & Co. KG
- Robert A. Smith, Boeing
- Przemyslaw Jakub Gromala, Bosch
- Steve Dunford, Schlumberger
- Nancy Stoffel, General Electric

# Dr. Varughese Mathew, NXP Semiconductors



- Varughese Mathew joined Motorola Semiconductor Products Sector (now NXP Semiconductors), after working as a Post-Doctoral Fellow in the Department of Materials Science and Engineering, University of Arizona, Tucson, AZ.
- His recent focus is on the material development for high temperature automotive electronic applications and corrosion reliability of electronic packaging.
- He published about 40 technical papers and the inventor/co-inventor of 27 U.S. patents.
- Varughese also served as a member of Packaging Technical Advisory Board (TAB) of GRC division of Semiconductor Research Corporation (SRC) and was the 2012 TAB Chair.

# Anton-Zoran Miric, Heraeus



- Anton Miric is Vice President of Product Management in material solutions with experience in joining, interconnect and substrate materials for micro- and power electronic applications.
- In last 25 years, A. Miric published over 30 technical papers about electronic materials in different magazines in Europe and in the USA. In addition, he gave more than 100 Lectures, Seminars and Workshops all over the world.
- An Article “Lead-Free Alloys” won an Award from “MCB University Press Awards for Excellence 1999” as the best article published in the Magazine “Soldering & Surface Mount Technology”.
- Anton Miric is member in different associations & committees, e.g. ECPE, ZVEI, NPE, VDA, eNova, iNEMI, IPC.

# Dr. Robert Smith, Boeing



- Dr. Robert Smith is a Technical Fellow with Boeing Research & Technology in the domain of Remote Sensing Systems and is Boeings Technical Representative to the NextFlex Consortium.
- He has been involved in sensing system development and implementation for logistic tracking, RFID and other approaches to see 'things' at long range or in difficult environments which have been used on satellites, space platforms, launch vehicles, aircraft platforms and by the warfighter.
- His current focus is additive manufacturing of sensor systems to enable platform awareness and eliminate wires. Robert holds 15 patents including 2 foreign patents and was the recipient of a Boeing Special Invention award in 2010.

# Dr. Przemyslaw Gromala, Robert Bosch GmbH



- Przemyslaw Gromala is a simulation senior expert at Robert Bosch GmbH, Automotive Electronics in Reutlingen. His research activities focus on virtual pre-qualification techniques for development of the electronic control modules and multi-chip power packaging.
- His technical expertise includes material characterization and modeling, multi-domain and multi-scale simulation incl. fracture mechanics, verification techniques and prognostics and health monitoring for future safety related electronic smart systems.
- He is an active committee member of the IEEE conferences: ECTC, EuroSimE, ICEPT; ASME: InterPACK.
- He holds a PhD in mechanical engineering from Cracow University of Technology in Poland.

# Steve Dunford, Schlumberger



- Steve is a member of the Schlumberger PWA Center of Practical Excellence, a global organization focused on all aspects of electronic board level reliability in harsh environments.
- His responsibilities include R&D on materials, component packaging, and process improvements to enhance board level reliability.
- He also supports PWA NPD, and failure analysis. .



# Dr. Nancy Stoffel, General Electric



- Nancy Stoffel works at GE Global Research, and is currently the Horizontal Leader for Flexible Hybrid Electronics.
- She has 20+ years of experience in the electronics packaging field working in both technical and managerial roles.
- Nancy was the Director of Microsystems Packaging at STC MEMS. She also worked at Xerox, and IBM in the areas of materials and process development for microsystems and electronic packaging.
- Nancy received a PhD from Cornell in Materials Science.