



Thursday, September 20, 2007

Automotive: Advanced High-Strength and Other Specialty Sheet Steel Products for the Automotive Industry

Auto/Steel Partnership 20th Anniversary Symposium

Room: W2-65

Session Chair: Jody Hall, General Motors Corp.

Keynote Address

9:00 AM

Lightweight Front End AHSS Structure - Performance Validation and Cost Evaluation

J. Shaw*, United States Steel Corporation, USA; S. Shah, General Motors Corporation, USA

9:20 AM

Lightweight Steel Passenger Compartment Solution for IIHS Side Impact and 2.5X Roof Strength Requirement

Joe Polewarczyk*, General Motors Corp.; Jody Shaw, United States Steel Corp., USA

9:40 AM

Characterization of Strain and Strain Rate Histories in High Strength Steel During Progressive Crush

S. Simunovic, J. Starbuck, Oak Ridge National Laboratory, USA; K. Wang*, P. Nukala, General Motors Corporation, USA

10:00 - 10:20 a.m.

Break

10:20 AM

Correlation of FEA Prediction and Experiments on Dual-Phase Steel Automotive Rails

C. Du*, DaimlerChrysler Corporation, USA; X. Chen, United States Steel Corporation, USA; T. Lim, DoFasco Inc., Canada; T. Chang, Severstal North America Inc., USA; P. Xiao, D. Liu, Generality, LLC., USA

10:40 AM

Improving the Life of High-Strength Steel Stamping Dies

A. Pearson*, General Motors Corporation, USA

11:00 AM

Fatigue Performance of Conventional and Advanced High Strength Steel Spot Welds

J. Bonnen, R. Iyengar*, Ford Motor Company, USA

11:20 AM

Influence of Minor Alloying Elements in Steels Used for Critical Applications

R. Arasanipalai*, N. S. Prasad, MIDHANI, India

11:40 AM

Formation of Ceramic Layer on Steel Strips by Combined Method of Cladding and PEO

H. A. Dehghanian*, M. H. Shariat, A. Dehghan, H. Danesh manesh, Shiraz university, Iran

Automotive: Automotive and Ground Vehicles: Materials and Processes for Vehicles

Cast Iron

Room: W2-62

Session Chairs: Dan Wilson, General Motors; Phil Seaton, DaimlerChrysler

8:30 AM

Introductory Remarks

8:40 AM

Cast Iron – A High Tech Material?

A. Alagarsamy*, Citation Corp., USA

9:00 AM

Cast Iron Microstructure Evolution in High Temperature Automotive Manifold Applications

B. Black*, S. Yu, R. N. Logan, Wescast, Canada

9:20 AM

Why Austempered Ductile Iron Belongs in the Automotive Industry

K. L. Hayrynen*, J. R. Keough, Applied Process Inc, USA

9:40 AM

Influence of Graphite Nodules Geometrical Features on Fatigue Strength on High Strength Nodular Grey Cast Iron

N. Costa*, F. S. Silva, Minho University, Portugal

10:00 - 10:20 a.m.

Break

10:20 AM

Solidification and Casting Process Simulation of Ferrous Materials (Invited)

C. Heisser*, MAGMA Foundry Technologies, Inc., USA

10:40 AM

Current Efforts and Metallurgical Aspects in Solidification Processing of Cast Iron (Invited)

D. M. Stefanescu*, The Ohio State University, USA

11:00 AM

Current Efforts in Computational Modeling of Cast Iron (Invited)

D. M. Stefanescu*, The Ohio State University, USA; A. Catalina, Caterpillar Inc., USA

11:20 AM

Effects of Refractory Coatings on the Performance of a Chemically Bonded Sand System at Elevated Temperatures (Invited)

S. N. Ramrattan*, A. Abdelwahab, Western Michigan University, USA

Automotive: Automotive Light Metal Castings: Technology and Applications

Casting Process Development, Material Properties and Performance

Room: W2-64

Session Chairs: James Boileau, Ford Motor Company; Guoqiu He, Tongji University

8:30 AM

Introductory Remarks

Thursday AM

* Denotes Presenting Author

8:40 AM

A Study of Microstructure and Tensile Properties for an A356-T6 Aluminum Alloy (Invited)

X. Liu, G. He*, S. Fan, School of Material Science and Engineering, Tongji University, China; Q. Wang, GM Powertrain, USA

9:20 AM

Creep Behavior of Die Cast and Permanent Mold Cast Mg-Al-Ca Based Alloys

N. D. Saddock*, A. Suzuki, J. Jones, T. M. Pollock, University of Michigan, USA

9:40 AM

Microstructural Effects on the Ductility in Cast AM50 Mg

J. M. Boileau*, J. A. Hines, Ford Motor Company, USA

10:00 - 10:20 a.m.

Break

10:20 AM

Microstructure and Tensile Fracture Behavior of a Cast Aluminum Alloy A356

G. Ran*, J. Zhou, Xi'an Jiaotong University, China; Q. Wang, General Motors Corporation, USA

10:40 AM

The Effect of Grain Refinement, Eutectic Si Modification and Hydrogen Concentration on Porosity in 319-Type Aluminum Alloy Castings

J. W. Zindel*, L. A. Godlewski, Ford Motor Company, USA

11:00 AM

Gas Pressures in Organically Bonded Sands

L. Winardi*, H. E. Littleton, University of Alabama at Birmingham, USA

11:20 AM

Effect of Heat Treatment on the Dimensional Stability of Cast 300-Series Aluminum Alloys

J. M. Boileau*, Ford Motor Company, USA

11:40 AM

Consideration Manufacturing Influences in the Modern Fatigue Assessment for Powertrain and Drivetrain Designs FEMFAT – Boundary Layer Model

H. Dannbauer, C. Gaier, M. Meise*, Magna Powertrain / Engineering Center Steyr, USA

Automotive: High-Density Hydrogen Storage for Automotive Applications: Materials and Methods

Physisorptive Systems II and Other Techniques

Room: W2-66

Session Chair: Christopher Wolverton, Northwestern University

8:10 AM

Introductory Remarks

8:20 AM

First-Principles Study of Nanostructured Materials for Room-Temperature Reversible Hydrogen Storage (Invited)

S. Zhang*, Y. Kim, Y. Zhao, National Renewable Energy Laboratory, USA; A. Williamson, Lawrence Livermore National Laboratory, USA; Y. Sun, A. C. Dillon, M. J. Heben, National Renewable Energy Laboratory, USA

9:00 AM

Hydrogen Storage at Ambient Temperature by Spillover (Invited)

R. Yang*, University of Michigan, USA

9:40 AM

Science and Technology of Al-Ga Alloys as a Material for Energy Storage, Transport and Splitting Water

J. Woodall*, J. Ziebarth, C. Allen, Purdue University, USA

10:00 - 10:20 a.m.

Break

Chemical Storage I

Room: W2-66

Session Chair: Christopher Wolverton, Northwestern University

10:20 AM

An Integrated Hydrogen Storage and Delivery Approach Using Organic Liquid-phase Carriers (Invited)

A. Cooper*, A. Scott, D. Fowler, G. Muraro, J. Cunningham, F. Wilhelm, M. Ford, B. Toseland, G. Pez, Air Products and Chemicals, Inc., USA

11:00 AM

On-Board Hydrogen Storage Systems for Liquid Carriers (Invited)

R. K. Ahluwalia*, T. Q. Hua, J. K. Peng, Argonne National Laboratory, USA

11:40 AM

Storage of Hydrogen in Anhydrous Ammonia (Invited)

J. Holbrook*, AmmPower LLC, USA; N. Olson, Iowa Energy Center, USA

Automotive: Zinc Coated Steel Sheets

Zinc Coated Sheet Steels 2

Room: W2-69

Session Chair: Joseph McDermid, McMaster University

8:30 AM

Introductory Remarks

8:40 AM

Aleutec, A New Zinc Coating for Steel

W. J. VanOoij*, University of Cincinnati, USA; J. Zervoudis, G. Poag, Teck Cominco, Canada

9:00 AM

Properties of Zinc Magnesium Coatings on Hot-Dip Galvanized Steel Sheets

F. Roegner*, B. Scheffel, O. Zywitzki, C. Metzner, Fraunhofer Institute of Electron Beam and Plasma Technology, Germany

9:20 AM

Mechanism and Growth of Dross on the Submerged Pot Hardware in Galvalume (GL) Bath

B. S. Kang*, A. Varadarajan, West Virginia University, USA

9:40 AM

XRF as a Method for Measuring Coat Weight Thickness of Various Conversion Coatings on Steel or Aluminum

S. Fess*, Spectro Analytical Instruments, USA

Electronic and Magnetic Properties: Perovskite Material Engineering

Nano-scale Engineering B: Thin Films and Dielectric Response

Room: D2-11

Session Chair: Jennifer Sigman, Sandia National Laboratories

8:30 AM

Introductory Remarks

8:40 AM

Ultraviolet Raman Spectroscopy of Nanoscale Ferroelectric Heterostructures (Invited)

D. A. Tenne*, Boise State University, USA; A. Bruchhausen, A. Fainstein, Centro Atomico Bariloche, Argentina; R. S. Katiyar, University of Puerto Rico, Puerto Rico; A. Cantarero, University of Valencia, Spain; A. Soukiasian, W. Tian, D. G. Schlom, Y. L. Li, L. Chen, Pennsylvania State University, USA; Q. X. Jia, Los Alamos National Laboratory, USA; K. J. Choi, D. M. Kim, C. Eom, University of Wisconsin, USA; H. P. Sun, X. Q. Pan, University of Michigan, USA; S. M. Nakhmanson, K. M. Rabe, Rutgers University, USA; X. X. Xi, Pennsylvania State University, USA

9:20 AM

Dielectric Properties of Artificially Structured Perovskite Thin Films (Invited)

J. Hwang*, Pusan National University, South Korea

10:00 - 10:20 a.m.

Break

10:20 AM

The Dielectric Response of (Ba,Sr)TiO₃ Thin Films for Integration into Tunable Microwave Devices (Invited)

J. Sigman*, P. G. Clem, C. D. Nordquist, Sandia National Laboratories, USA

11:00 AM

A-Site Substitution Controlled Dielectric Dispersion in Lead Free Sodium Bismuth Titanate

S. V. Shambuni, Swarna Bharati Inst of Science and Technology, India; G. Prasad*, Osmania University, India; M. Raghavender, Swarna Bharati Inst of Science and Technology, India; T. Bhimasankaram, Osmania University, India

Electronic and Magnetic Properties: Spintronic Materials and Devices

Spintronic Materials I

Room: D2-10

Session Chair: Sean Li, University of New South Wales

8:50 AM

Introductory Remarks

9:00 AM

Magnetic Imaging and Reversal Mechanism of Patterned Ferromagnetic Elements (Invited)

Y. Zhu*, L. Huang, Brookhaven National Lab, USA; J. Lau, NIST, USA; M. Schofield, M. Beleggia, Brookhaven National Lab, USA

9:20 AM

Spin Injection, Diffusion, and Detection in Lateral Spin-Valves (Invited)

A. Hoffmann*, Argonne National Laboratory, USA; Y. Ji, University of Delaware, USA; J. E. Pearson, S. Jiang, S. D. Bader, Argonne National Laboratory, USA

9:40 AM

Investigation of Coupling Between the Two (Ga,Mn)As Layers in (Ga,Mn)As/GaAs/(Ga,Mn)As Structures

Z. Ge*, Y. Zhou, Y. Cho, X. Liu, J. K. Furdyna, M. Dobrowolska, University of Notre Dame, USA

10:00 - 10:20 a.m.

Break

10:20 AM

Laser Induced Electron Spin Polarization in GaAs Crystal and the Polarization Measurement by NEA Extraction (Invited)

R. Shang*, Tsinghua University, China

10:40 AM

Room Temperature Ferromagnetism and n-Type Conductivity in Zn_{1-x}Fe_xO

S. Kolesnik*, B. Dabrowski, Northern Illinois University, USA; W. L. Lim, University of Notre Dame, USA; M. Pekala, Warsaw University, Poland

11:00 AM

Room Temperature Ferromagnetism in Co Doped ZnO (Invited)

R. S. Katiyar*, K. Samanta, P. Bhattacharya, University of Puerto Rico, Puerto Rico; J. G. Duque, C. Rettori, P. G. Pagliuso, UNICAMP, Brazil

Electronic and Magnetic Properties: Structure-Property Relationships of Multifunctional Oxide Thin Films and Interfaces

Oxide Film Synthesis and Integration

Room: D2-08

Session Chairs: Jianguo Zhu, Sichuan University; Isao Tanaka, University of Kyoto

8:30 AM

Introductory Remarks

8:40 AM

Strain-Enhanced Dielectric and Ferroelectric Properties of Pb(Zr_{0.8}Ti_{0.2})O₃/Pb(Zr_{0.2}Ti_{0.8})O₃ Multilayer Thin Films Without Buffer Layers (Invited)

J. Zhu*, H. Liu, X. Gong, J. Liang, X. Li, D. Xiao, Sichuan University, China; Z. Pu, National Engineering Research Center for Nanotechnology, China

9:20 AM

Giant Thermoelectric Seebeck Coefficient of Two-Dimensional Electron Gas in SrTiO₃: Cs-Corrected STEM-ELNES and First Principles Study (Invited)

T. Mizoguchi*, The University of Tokyo, Japan; H. Ohta, Nagoya University and JST, Japan; Y. Mune, Nagoya University, Japan; T. Yamamoto, Y. Ikuhara, The University of Tokyo, Japan

10:00 - 10:20 a.m.

Break

10:20 AM

Chemical-Solution Processing of (K_xNa_{1-x})_{0.5}Bi_{0.5}TiO₃

J. F. Carroll*, D. A. Payne, University of Illinois at Urbana-Champaign, USA; H. D. Pratt, T. J. Boyle, Sandia National Laboratories, USA

10:40 AM

Microstructure of Solid Solution GdScO₃ and LaAlO₃ Thin Films Grown on (001) LaAlO₃ Substrate

Y. Chen*, X. Pan, University of Michigan, USA; H. Christen, Oak Ridge National Laboratory, USA; D. Schlom, The Pennsylvania State University, USA

11:00 AM

Enhanced Ferroelectric Properties of Epitaxial BiFeO₃ Thin Films on Si (Invited)

C. Eom, H. Jang*, University of Wisconsin-Madison, USA

11:40 AM

In-situ TEM Observations of Nucleation and Growth of Ferroelectric Domains in BiFeO₃ Thin Films

C. Nelson*, X. Pan, University of Michigan, USA; D. Ortiz, S. Baek, H. Jang, C. Eom, University of Wisconsin-Madison, USA

Energy: Degradation of Materials for Application in Nuclear Power and Waste Management Systems

Degradation of Materials for Application in Nuclear Power Systems

Room: D2-12

Session Chair: Aladar Csontos, U.S. Nuclear Regulatory Commission

8:30 AM

Introductory Remarks

8:40 AM

Modelling of the Oxide Film Growth and Layer Restructuring on Stainless Steels and Nickel-Based Alloys in LWRs (Invited)

I. Betova, Technical University of Sofia, Bulgaria; M. Bojinov*, University of Chemical Technology and Metallurgy, Bulgaria; P. Kinnunen, VTT Technical Research Center of Finland, Finland; K. Lundgren, ALARA Engineering, Sweden; T. Saario, VTT Technical Research Center of Finland, Finland

9:20 AM

Evaluating Flaws in Nuclear Power Plant Piping: A Case Study (Invited)

A. A. Csontos*, U.S. Nuclear Regulatory Commission, USA; D. L. Rudland, D. Shim, H. Xu, G. Wilkowski, Engineering Mechanics Corporation of Columbus, USA

10:00 - 10:20 a.m.

Break

10:20 AM

Corrosion of Ferritic-Martensitic Steels in Supercritical Water

X. Ren*, K. Sridharan, T. R. Allen, University of Wisconsin, USA

10:40 AM

Effects of Gamma Radiation on Steel Corrosion

J. Noel*, K. Daub, X. Zhang, C. Wren, University of Western Ontario, Canada

11:00 AM

Oxidation Behavior of Shot-Peened Incoloy Alloy 800H Exposed to Supercritical Water and Cyclic Oxidation in Air

L. Tan*, X. Ren, K. Sridharan, T. R. Allen, University of Wisconsin-Madison, USA

11:20 AM

Behaviour of NiCr Coatings under Different Environments

N. Bala*, H. S. Sahhet, BBSBEC, Fatehgarh Sahib, India; S. Prakash, IITR, India

11:40 AM

Corrosion Analysis of Crucible Materials Used in Pyroprocessing of Spent Nuclear Fuel

P. Periasamy*, G. Balfour, B. Marx, D. Butt, Boise State University, USA; M. Simpson, Idaho National Laboratory, USA

Energy: Energy Materials

Nuclear Materials

Room: D2-13

Session Chairs: Joseph Newkirk, U. of Missouri-Rolla; Linda Jones, Smith College

8:30 AM

Introductory Remarks

8:40 AM

Influence of Gamma Radiation on Carbon Fiber Reinforced Epoxy Matrix Composite

E. Hoffman*, E. Skidmore, P. Korinko, T. White, Savannah River National Laboratory, USA

9:00 AM

Diffusion Bonding of Be to CuCrZr for ITER First Wall Structures

J. Puskar*, S. H. Goods, C. H. Cadden, Sandia National Laboratories, USA

9:20 AM

Trapping, Migration and Desorption of Helium in Tungsten: Influence of the Implantation Conditions

A. Debelle*, M. Barthe, T. Sauvage, CERI-CNRS, France; C. Peaucelle, IPNL, France

9:40 AM

Ni-Si Alloys for Hydrogen Generation by Nuclear Reactor

J. W. Newkirk*, R. K. Brow, J. Hsu, C. P. Larson, U. of Missouri-Rolla, USA

10:00 - 10:20 a.m.

Break

10:20 AM

X-Ray Diffraction of Nuclear Graphite

L. E. Jones*, Smith College, USA

10:40 AM

Helium Bubble Development in Erbium Dinitride

G. Bond*, New Mexico Tech, USA; J. F. Browning, C. S. Snow, Sandia National Laboratories, USA

11:00 AM

Synthesis of Dysprosium Nitride via Direct Nitrification of Dysprosium Metal

B. J. Jaques*, D. P. Butt, B. M. Marx, A. S. Hamdy, D. Osterberg, G. Balfour, Boise State University, USA

Energy: Fuel Cells: Materials, Processing, Manufacturing and Power Management Technologies

Interconnects of High Temperature Fuel Cells I

Room: D2-14

Session Chairs: Zhenguo "Gary" Yang, Pacific Northwest National Lab; Xingbo Liu, West Virginia University

8:30 AM

Introductory Remarks

8:40 AM

Degradation of SOFC Metallic Interconnect in Coal Syngas

R. Dastane*, West Virginia University, USA; C. Johnson, National Energy Technology Laboratory, USA; X. Liu, West Virginia University, USA



9:00 AM

Investigation and Development of Cost-Effective Ferritic Stainless Steels for SOFC Interconnect Applications

Z. Yang*, G. Xia, Z. Nie, J. W. Templeton, J. W. Stevenson, P. Singh, Pacific Northwest National Lab, USA; J. Rakowski, Allegheny Ludlum Co., USA

9:20 AM

Metallic Foams for Solid Oxide Fuel Cell Interconnects

D. Dunand*, Northwestern University, USA; Y. Boonyongmaneerat, Chulalongkorn University, Thailand; J. Scott, Northwestern University, USA

9:40 AM

The Performance of Ce Surface Treated Ferritic Stainless Steels for Solid Oxide Fuel Cell Interconnects

D. E. Alman*, P. D. Jablonski, National Energy Technology Laboratory, USA

10:00 - 10:20 a.m.

Break

10:20 AM

Surface Modification of Metallic Interconnects in SOFCs for Improved Surface and Electrical Stability

Z. Yang*, G. Xia, J. W. Templeton, Z. Nie, L. Li, J. W. Stevenson, P. Singh, Pacific Northwest National Lab, USA

10:40 AM

The Application of Protective Coatings on Crofer 22 APU

R. Bateni*, P. Wei, A. Petric, McMaster University, Canada

11:00 AM

Anodic Electrodeposition of Mn-Co Oxide Coatings for Stainless Steel Interconnects Utilized in Solid Oxide Fuel Cells

W. Wei*, W. Chen, D. G. Ivey, University of Alberta, Canada

11:20 AM

Pulse Plating of Manganese-Cobalt Alloys for SOFC Interconnect Application

J. Wu*, Y. Jiang, West Virginia University, USA; C. Johnson, National Energy Technology Laboratory, USA; M. Gong, X. Liu, West Virginia University, USA

11:40 AM

Thermal Stability and Oxidation Resistance of Protective Oxide Coatings on Ferritic Steels for SOFC Interconnect Applications

R. J. Smith*, H. Chen, W. Priyantha, M. Koczyk, J. Lucas, K. Lund, Montana State University, USA; M. Finsterbusch, TU Ilmenau, Germany; A. Kayani, Western Michigan University, USA; P. E. Gannon, P. White, M. C. Deibert, Montana State University, USA; V. Gorokhovskiy, Arcocomac Surface Engineering, LLC, USA; V. Shutthanandan, P. Nachimuthu, Pacific Northwest National Laboratory, USA

Fundamentals and Characterization: Characterization and Modeling of the Mechanical Performance of Advanced Alloys: Bridging the Data Gap

Characterization of Advanced Alloys-II

Room: D0-07B

Session Chair: Mark Iadicola, National Institute of Standards and Technology

8:30 AM

Introductory Remarks

8:40 AM

Microstructural Evolution and Mechanical Properties of IN740 Superalloy

Q. Wu, ON Semiconductor, USA; H. Song, University of Cincinnati, USA; M. Nahar, Indian Institute of Technology, India; J. P. Shingledecker, Oak Ridge National Laboratory, USA; V. K. Vasudevan*, University of Cincinnati, USA

9:00 AM

The Effect of Creep Induced Microstructural Changes on the Magnetic Properties of Ferromagnetic Steels

A. Polar, J. Indacochea*, University of Illinois at Chicago, USA

9:20 AM

Newtonian Viscous Creep Mechanisms in a Titanium-Based Alloy

S. Gollapudi, I. Charit, K. L. Murty*, NC State University, USA

9:40 AM

The Influence of Variable Joint Strength in Compression Testing of Periodic Cellular Metals

B. A. Bouwhuis*, E. Bele, G. D. Hibbard, University of Toronto, Canada

10:00 - 10:20 a.m.

Break

10:20 AM

The Stress-Dependence of Emission Energies in Direct and Indirect Al(x)Ga(1-x)As

A. J. Paul*, G. W. White, National Institute of Standards and Technology, USA

10:40 AM

Optimization of Dry Powder Particle Size Analysis

D. Griffiths*, M. Pejcinovic, HORIBA Instruments Inc., USA

Fundamentals and Characterization: Fundamentals of Brittle Fracture

Modeling

Room: D0-03A

Session Chair: Jon West, Vicus Technologies, LLC

8:30 AM

Introductory Remarks

8:40 AM

Non-linear Dynamic Effects in the Fracture of Materials (Invited)

M. Marder*, The University of Texas at Austin, USA

9:20 AM

Molecular Simulations of Fracture in Bulk and Confined Glasses (Invited)

S. Garofalini*, Rutgers University, USA

10:00 - 10:20 a.m.

Break

10:20 AM

A Simple Deterministic Failure Model for Quasi-Brittle Materials

A. S. Fok*, H. Li, University of Manchester, United Kingdom

10:40 AM

Atomistic Simulation of Cracktip Failure Pathways in Fe and Fe Alloys

P. A. Gordon*, T. Neeraj, M. J. Luton, ExxonMobil Res. & Engr., USA

Thursday AM

11:00 AM

Panel Discussion

Fundamentals and Characterization: High Temperature Material Systems: Fatigue Mechanisms and Prognosis

Role of Environment on Failure Mechanisms of Single Crystal Superalloys

Room: D0-02AB

Session Chairs: Andrew Rosenberger, US Air Force; P. Wright, GE Aviation

8:30 AM

Introductory Remarks

8:40 AM

High Temperature Fatigue of Nickel-Base Superalloys Single Crystals (Invited)

P. D. Portella*, B. Skrotzki, H. Klingelhoeffer, B. Fedelich, R. Sievert, Fed Inst Materials Res & Testing, Germany

9:20 AM

Coupled Creep-Fatigue-Environment Damage in a Directionally-Solidified Ni-base Superalloy (Invited)

A. P. Gordon*, University of Central Florida, USA

10:00 - 10:20 a.m.

Break

10:20 AM

Effect of Carbide Morphology and Defects on Fatigue Properties of a Modified Single Crystal Ni-Base Superalloy

A. Wasson*, E. R. Cutler, University of Florida, USA; D. Ness, Imperial College London, United Kingdom; G. E. Fuchs, University of Florida, USA

10:40 AM

Primary Creep and the Rhenium Effect in Ni-base Superalloys PWA 1480 and PWA 1484

B. C. Wilson*, G. E. Fuchs, University of Florida, USA

11:00 AM

Creep and Microstructure of Precious Metal Modified Ni-Based Superalloys

J. Van Sluytman*, A. Suzuki, T. M. Pollock, University of Michigan, USA

11:20 AM

Effect of Boron on High Temperature Oxidation Resistance of Alloys from Nb-W-Cr System

B. I. Portillo*, P. Kakarlapudi, S. K. Varma, Univ. of Texas at El Paso, USA

11:40 AM

Characterization of Oxidation Products in Ternary Alloys Containing C Modifiers

M. D. Gonzalez*, P. Kakarlapudi, B. Portillo, S. K. Varma, University of Texas at El Paso, USA

Fundamentals and Characterization: International Symposium on Defects, Transport and Related Phenomena

Defect-Related Phenomena II

Room: D0-03C

Session Chairs: Julia Medvedeva, University of Missouri-Rolla; Shu Yamaguchi, The University of Tokyo

8:30 AM

Introductory Remarks

8:40 AM

Complex Oxides as Novel Transparent Conductors (Invited)

J. Medvedeva*, University of Missouri-Rolla, USA

9:20 AM

Surface vs. Bulk Electronic and Defect Structures of (Zn-In-Sn and Cd-In-Sn) Bixbyite Transparent Conducting Oxides

S. P. Harvey*, T. O. Mason, Northwestern University, USA; C. Koerber, A. Klein, Darmstadt University of Technology, Germany; B. Buchholz, R. P. Chang, Northwestern University, USA

9:40 AM

Enhancement of Oxygen Exchange in Sr(Ti_{1-x}Fe_x)O_{3-δ} by means of Alkaline Earth Oxide Coatings

S. F. Wagner*, W. Menesklou, Universitaet Karlsruhe (TH), Germany; C. Argiris, G. Borchart, Technische Universitaet Clausthal, Germany; E. Ivers-Tiffée, Universitaet Karlsruhe (TH), Germany

10:00 - 10:20 a.m.

Break

10:20 AM

Development of Nonstoichiometry-Induced Carrier Modification Device Based on Nanoionics Principle (Invited)

S. Yamaguchi*, T. Tsuchiya, Y. Oyama, University of Tokyo, Japan; K. Terabe, T. Hasegawa, National Institute for Materials Science, Japan

11:00 AM

Synthesis and Characterization of Bulk, Fully Dense, Nanocrystalline Fluoritic Oxides with Grain Size Below 20 nm (Invited)

U. Anselmi-Tamburini*, University of Pavia, Italy; Z. A. Munir, University of California, Davis, USA

11:40 AM

Discussion of future symposia on defects, etc.

Fundamentals and Characterization: Developments in Web-Based Materials Property Databases, Knowledge Management of Materials Information, and Materials Informatics for Accelerated Materials Discovery

Collaborative Computational Tools

Room: D0-06AB

Session Chair: Loni Peurrung, Pacific Northwest National Laboratory

8:30 AM

Introductory Remarks

Thursday AM

MS&T'07[®]

8:40 AM

**From Binary and Ternary Systems to Multicomponent Alloys-
Application of CALPHAD to Industrial Research and Alloy
Design (Invited)**

P. K. Mason*, Thermo-Calc Software Inc, USA

9:20 AM

**NIMS Materials Databases and Computational Tools for
Composite Materials Design**

Y. Xu*, M. Yamazaki, National Institute for Materials Science, Japan

9:40 AM

MatCASE Data Format for Materials Information

Z. Liu*, P. Raghavan, L. Chen, The Pennsylvania State University, USA

10:00 - 10:20 a.m.

Break

10:20 AM

Material Properties For Process Simulation (Invited)

Z. Guo, N. Saunders, P. Miodownik, J. Schille*, Sente Software Ltd, United Kingdom

11:00 AM

MatForge and Collaborative Code Development (Invited)

L. M. Bartolo*, Kent State University, USA

Fundamentals and Characterization: Numerical, Mathematical and Physical Modeling Tools for Materials Processes

Numerical, Mathematical, and Physical Modeling Tools for Materials Processes III

Room: D0-03D

Session Chairs: Patricio Mendez, Colorado School of Mines; Ben Li,
University of Michigan

8:30 AM

Introductory Remarks

8:40 AM

**Effect of Thermal Boundary Condition on Thermosolutal
Convection, Macroseggregation and Microstructure Formation of
Cu-Sn Alloys**

S. R. Kenkere Venkataramiah*, A. Srinivasan, G. Phanikumar, T. Prasannakumar, Indian
Institute of Technology, India

9:00 AM

**High Temperature Corrosion Studies on Dissimilar Friction
Welded and Electron Beam Welded AISI 304 and AISI 4140 in
the Molten Salt Environment of Na₂SO₄ + V₂O₅(60%)**

A. Natarajan*, S. Surendra, P. Satya, Indian Institute of Technology, Roorkee, India; R.
Madhusudhan, Defense Metallurgical Research Laboratory, India

9:20 AM

**High Temperature Corrosion Studies on Dissimilar Welded AISI
304 and AISI 4140 in Air and the Molten Salt Environment of
K₂SO₄ + NaCl (60%)**

A. Natarajan*, S. Surendra, P. Satya, Indian Institute of Technology, India; R. Madhusudhan,
Defense Metallurgical and Materials Research Laboratory, India

9:40 AM

**Simulation-Enabled Approach for Macro-Defects Prediction and
Avoidance of Metal-Formed Products**

M. Fu, J. Lu*, The Hong Kong Polytechnic University, Hong Kong

10:00 - 10:20 a.m.

Break

10:20 AM

**A Numerical Study of Plasma-Particle Energy Exchange
Dynamics in Induction Thermal Plasmas for Glassification**

M. M. Hossain*, Y. Yao, T. Watanabe, Tokyo Institute of Technology, Japan

10:40 AM

**Finite Element Analysis of Plastic Yielding in an Anisotropic
Plate with a Hole Using Refined Plate Theory**

T. Pervez*, R. A. Siddiqui, S. Z. Qamar, Sultan Qaboos University, Oman

Fundamentals and Characterization: Phase Stability, Diffusion and Their Applications

Phase Stability and Diffusion

Room: D0-04ABC

Session Chair: John Morral, The Ohio State University

8:30 AM

Introductory Remarks

8:40 AM

**Formation of a Defect Solid Solution in the Catalytic System
TiO₂-V₂O₅**

H. Schubert*, D. Habel, E. Feike, O. Goerke, Institute of Material Sciences and
Technologies, Germany; C. Hess, Fritz-Haber-Institute of the Max Planck Society, Germany

9:00 AM

**Preparation and Characterization of Ceria-Hafnia Nanoparticles
as a Function of Particle Size and Annealing Environment**

J. M. Raitano, S. Banerjee, Columbia University, USA; L. Zhang, Brookhaven National
Laboratory, USA; I. P. Herman, S. Chan*, Columbia University, USA

9:20 AM

Compression Behavior of Cr₃GaC Up to 50 GPa

S. R. Kulkarni*, V. R. Selva, N. A. Phatak, S. K. Saxena, Florida International University, USA

9:40 AM

**The Formation of Type 3 Boundaries in Interdiffusion
Microstructures**

J. Morral*, P. Pavka, The Ohio State University, USA

Fundamentals and Characterization: What We can Learn from Failure Analysis

Forming & Fabrication

Room: D0-01A

Session Chairs: Erhan Ulvan, Acuren Group Inc.; Amar Sabih, -
McGill Institute of Advanced Materials

8:30 AM

Introductory Remarks

8:40 AM

**A New Methodology to Optimize Multistage Cold-Heading
Designs (Invited)**

A. Sabih*, J. Nemes, McGill University, Canada

9:20 AM

**Formability in Bulk and Sheet Metal Forming Processes
(Invited)**

E. Ulvan*, Acuren Group Inc., Canada; D. Aliya, Aliya Analytical Inc., USA

10:00 - 10:20 a.m.

Break

Thursday AM

10:20 AM

Defects and Failures in Wiremaking

A. Koursaris*, University of the Witwatersrand, South Africa

10:40 AM

Failure of Furnace Brazed Blades in a Torque Converter Pump Application (Invited)

R. Sheth*, LuK USA, LLC., USA

11:00 AM

Understanding How to Recognize Lamination Discontinuities in Sheet Metal (Invited)

D. Aliya*, Aliya Analytical, Inc., USA

Materials and Systems: Coatings as an Enabler of System Performance

Coating Characterization

Room: O2-38

Session Chairs: Rodney Trice, Purdue University; Yutaka Kagawa, University of Tokyo

8:30 AM

Introductory Remarks

8:40 AM

Rapid Sensing of Silent Delamination in EB-PVD TBCs using New Luminescence System

Y. Kagawa*, K. Matumura, University of Tokyo, Japan

9:00 AM

Development of Photo-stimulated Luminescence Spectroscopy for 3D Stress Measurements in the Thermally Grown Oxide Layer of Thermal Barrier Coatings

S. Raghavan*, P. K. Imbrie, Purdue University, USA

9:20 AM

Sintering and Microstructural Evolution in Thermal Barrier Coatings

R. Krishnamurthy*, Caterpillar Inc., USA; D. J. Srolovitz, Yeshiva University, USA

9:40 AM

Effects of Microstructural Evolution during Stress Relaxation on the Thermal Conductivity of Plasma-Sprayed 7 wt% Y2O3-ZrO2 Coatings

C. A. Petorak*, Purdue University, USA; J. Ilavsky, Argonne National Lab, USA; B. Hammouda, NIST, USA; H. Wang, W. Porter, Oak Ridge National Lab, USA; R. W. Trice, Purdue University, USA

10:00 - 10:20 a.m.

Break

10:20 AM

Indenter Shape Effects on Interface Adhesion Measurement in Thermal Barrier Coating Systems

Q. Ma*, Walla Walla College, USA; J. L. Beuth, Carnegie Mellon University, USA; G. H. Meier, F. S. Pettit, University of Pittsburgh, USA

10:40 AM

Enhancing Toughness and Phase Stability of t' Zirconia with Suitable Co-Dopants

T. Schaedler*, A. G. Evans, C. G. Levi, University of California, USA

11:00 AM

Influence of a Viscoelastic Surface Infiltrate on the Damping Properties of Plasma Sprayed Alumina Coatings Part I: Room Temperature

P. Torvik*, Consultant, USA; R. Willson, APS Materials Inc, USA; J. Hansel, Universal Technology Corporation, USA

11:20 AM

Influence of a Viscoelastic Surface Infiltrate on the Damping Properties of Plasma Sprayed Alumina Coatings Part II: Effects of Elevated Temperature and Static Strain

P. Torvik, Consultant, USA; R. Willson, APS Materials, Inc., USA; J. Hansel, J. Henderson*, Universal Technology Corporation, USA

11:40 AM

Study of Tribological Issues during Chemical Mechanical Polishing

A. Kumar*, R. Mudhivarthi, University of South Florida, USA

Materials and Systems: Copper and Copper Alloys for Emerging Technologies

Copper Alloy Technology II

Room: O2-37

Session Chair: William Spiegelberg, Brush Wellman Inc.

8:30 AM

Introductory Remarks

8:40 AM

Advances in Copper Alloy Mold Materials for Plastic Injection and Blow Molding (Invited)

J. C. Kuli*, R. E. Kusner, Brush Wellman, Inc., USA

9:20 AM

Strength and Structural Evolution of Cu-15Ni-8Sn with Heat Treatment

J. Caris*, J. Lewandowski, Case Western Reserve University, USA; J. Stephens, Sandia National Laboratories, USA; D. Li, Case Western Reserve University, USA

9:40 AM

Texture Evolution of Copper During Swaging and Resultant Mechanical Properties

C. Cheng*, M. Zupan, T. Weerasooriya, UMBC- University of Maryland Baltimore County, USA

10:00 - 10:20 a.m.

Break

10:20 AM

Design of a Cu-Based Alloy Using NbCr₂ Precipitates (Invited)

G. M. Michal*, Case Western Reserve University, USA; D. L. Ellis, NASA Glenn Research Center, USA

11:00 AM

Synthesis and Properties of Bulk Amorphous Cu-Ti, Cu-Zr, and Cu-Ti-Zr Alloys

R. Hebert*, A. Mubarak, University of Connecticut, USA

11:20 AM

Microstructure and Mechanical Properties of Spray Formed Cu-13Sn-3Ni-0.7Si-0.5Cr Alloys

H. Kang*, S. Jang, K. Baik, Chungnam National University, South Korea; E. Lee, Research Institute of Industrial Science and Technology, South Korea

Materials and Systems: International Symposium on Ceramic Matrix Composites

UHTCs-I

Room: O2-43

Session Chairs: Gregory Hilmas, University of Missouri-Rolla; Narottam Bansal, NASA Glenn Research Center

8:30 AM

Introductory Remarks

8:40 AM

Structure-Property Relations in Monolithic and Fibrous Monolithic ZrB₂-Based Ceramics (Invited)

G. Hilmas*, W. G. Fahrenholtz, University of Missouri-Rolla, USA

9:20 AM

Control of Microstructures and Properties of Ultra High Temperature Ceramics

S. M. Johnson*, NASA Ames, USA; M. M. Stackpoole, ELORET Corporation, USA; M. J. Gasch, NASA Ames, USA; M. I. Gusman, ELORET Corporation, USA

9:40 AM

Microstructural Development and Mechanical Properties of HfB₂ Containing Carbon and B₄C Additives

H. J. Brown-Shaklee*, W. G. Fahrenholtz, G. E. Hilmas, University of Missouri-Rolla, USA

10:00 - 10:20 a.m.

Break

10:20 AM

Modeling, Processing, and Properties of ZrB₂ Ceramics with Novel SiC Additions

J. Watts*, M. Teague, G. Hilmas, B. Fahrenholtz, University of Missouri Rolla, USA

10:40 AM

Evolution of Convection Patterns in Liquid Oxide Films on ZrB₂-SiC Composites: Effect of Time and Temperature

S. Karlsdottir*, J. W. Halloran, University of Michigan, USA

11:00 AM

Effect of SiC Concentration on Convection Patterns in Liquid Oxide Films During High Temperature Oxidation of ZrB₂-SiC Composites

S. Karlsdottir*, J. W. Halloran, University of Michigan, USA

11:20 AM

Finite Element Modeling and Neutron Diffraction Testing of Residual Thermal Stresses in ZrB₂ - SiC ceramics

M. P. Teague*, G. E. Hilmas, W. G. Fahrenholtz, University of Missouri - Rolla, USA

Materials and Systems: Next Generation Biomaterials: Advanced Processing, Characterization and Modeling of Materials for Medical Devices

Physical and Mechanical Properties Characterization of Biomaterials, Part I

Room: O2-39

Session Chair: Elizabeth Perepezko, BIOMET Manufacturing Corporation

8:30 AM

Introductory Remarks

8:40 AM

Nanotechnology for Treating Organ Failure (Invited)

T. J. Webster*, Brown University, USA

9:20 AM

Nanoindentation of Biomaterials – Challenges and Solutions for the Next Generation (Invited)

M. E. Dickinson*, Hysitron Inc., USA

10:00 - 10:20 a.m.

Break

10:20 AM

Mechanical Properties of Hybrid Materials (Invited)

W. Shen*, R. Crombez, E. Montalvo, Eastern Michigan University, USA; A. Ovsianikov, B. N. Chichkov, Laser Zentrum Hannover, Germany; A. Doraiswamy, R. J. Narayan, University of North Carolina, USA

11:00 AM

Microstructure Characteristics, Interfacial Combining Mechanism and Toughening Mechanism of HA/316L Powder Biological Functionally Gradient Materials

Z. Jianpeng*, R. Jianming, Z. Zhongcheng, H. Baiyun, Central South University, China

11:20 AM

Fracture and Fatigue Behavior of Multi-Strand Implantable Electrodes

R. Varadarajan*, L. Ovidiu, C. Tuma, B. Smith, J. Lewandowski, Case Western Reserve University, USA

11:40 AM

Multi-Length Scale Severe Plastic Deformation of Two-Phase Titanium, Ti-6Al-4V, Intended for Medical Device Application

H. Rack*, Clemson University, USA

Nanotechnology: Innovative 3D Nanoparticulate Material Processing

3D Nanoparticulate Material Characterization

Room: W2-58

Session Chair: Ming-Jen Pan, US Naval Research Laboratory

8:30 AM

Introductory Remarks

8:40 AM

Hierarchically-Structured ZnO Nanoparticle Film for Dye-Sensitized Solar Cells (Invited)

G. Cao*, University of Washington, USA

9:20 AM

β-Tricalcium Phosphate Powders Synthesis for Bone Grafts

S. Dasgupta, S. Bose*, Washington State University, USA

9:40 AM

Electroless Coating of Ni-B Nanolayer onto Boron Carbide Particles for Bulk Compact Forming

K. Lu*, X. Zhu, H. Dong, Virginia Polytechnic Institute and State University, USA; K. Nagarathnam, Ultron, Inc., USA

10:00 - 10:20 a.m.

Break

10:20 AM

TiO₂ Nanoparticle Self-assembly onto Carbon Nanotubes

H. Dong*, K. Lu, Virginia Tech, USA

10:40 AM

General and Simple Approach for Visual Detection of Multiple Pollutant Cations Using Three-Dimensional Nanoscale Structures

S. A. El-Safty*, A. A. Ismail, H. Matsunaga, Y. Kiyozumi, F. Mizukami, National Institute of Advanced Industrial Science and Technology (AIST), Japan

Nanotechnology: Materials Characterization at the Nanoscale: Instrumentation and Applications

Scanning Probe Microscopy

Room: W2-61

Session Chair: Bryan Huey, University of Connecticut

8:30 AM

Introductory Remarks

8:40 AM

Atomic Force Microscopes: Enabling the Nanotechnology Revolution (Invited)

P. West*, Pacific Nanotechnology, USA

9:20 AM

Characterizing a Capillary Bridge with an AFM

J. J. Valenza*, D. L. Johnson, Schlumberger-Doll Research, USA

9:40 AM

High Speed Scanning Property Mapping

N. Polomoff, R. Nath, D. Shuman, K. Bagnoli, M. Zhao, B. D. Huey*, University of Connecticut, USA

10:00 - 10:20 a.m.

Break

10:20 AM

Probing Local Electronic Properties in Oxides: Charge Density Waves and High k Thin Films (Invited)

D. Bonnell*, M. Nikiforov, University of Pennsylvania, USA

11:00 AM

High-Resolution Atomic Force Microscopy: Where are We, and Where Will the Future Take Us? (Invited)

U. Schwarz*, Yale University, USA

Nanotechnology: Nanomaterials for Electronic Applications

Nanotubes, Nanofibers and Nanowires

Room: O2-44

Session Chair: Sharmila Mukhopadhyay, Wright State University

8:30 AM

Introductory Remarks

8:40 AM

Synthesis, Characterization, Device Fabrication, and Properties of Novel Functional-Oxide Nanowires (Invited)

N. P. Padture*, The Ohio State University, USA

9:20 AM

Contact Structure Formation in Carbon Nanotube Electronic Devices with Different Metal Electrodes

W. Luo*, K. Ravichandran, W. Windl, The Ohio State University, USA; L. Fonseca, Universidade Estadual de Campinas, Brazil

9:40 AM

Growth and Transplant of Carbon Nanotubes on Flexible Substrates

S. Chang*, T. Chen, T. Chin, C. Wang, National Tsing Hua University, Taiwan

10:00 - 10:20 a.m.

Break

10:20 AM

Fabrication of Patterned Metallic Nanowire Array Using Anodic Aluminum Oxide for Interconnection Applications

C. Hui*, G. Chee Lip, O. Beng Seng, L. Shao Zhou, M. Jan, Nanyang Technological University, Singapore; C. Ser Choong, G. Sharma, K. Vaidyanathan, Institute of Microelectronics, Singapore

10:40 AM

Nantero's NRAM™ Universal Memory Developed With Microelectronic Grade Carbon Nanotube Formulation

G. E. Ghenciu*, Nantero Inc., USA

11:00 AM

Electrospinning Conductive Nanofibers for Sensor Applications

S. Nartker*, L. Drzal, M. Misra, Michigan State University, USA

11:20 AM

Template Synthesis of Cobalt and Cobalt Oxide Nanostructures

M. S. Bhuiyan*, M. Paranthaman, M. Hu, Oak Ridge National Laboratory, USA

Nanotechnology: Nanostructured Ceramic Materials: Science and Technology

Simulations of Nanomaterials

Room: W2-67

Session Chair: Anthony Sutorik, Nanocerox

8:30 AM

Introductory Remarks

8:40 AM

First Order Reversal Curves Diagrams of Ferroelectrics in Relationship with Their Microstructural Characteristics (Invited)

L. Mitoseriu*, L. Stoleriu, A. Stancu, Al. I. Cuza University, Romania

9:20 AM

Study by Topological Methods for Establishing Dimensional Repartition of Nano-Ceramic Powders (Packing and Porosity in Real Space Geometric R3 Space)

N. Popescu-Pogriion*, I. Mercioniu, S. Constantinescu, National Institute for Materials Physics, Romania

9:40 AM

Theoretical Approach for Digestive Ripening

D. Lee*, Seoul National University, South Korea; S. Park, Samsung Advanced Institute of Technology, South Korea; J. Lee, Michigan Technological University, USA; N. Hwang, Seoul National University, South Korea



Nanotechnology: Mechanics of Nanomaterials and Micro/Nanodevices - Experimental and Modeling

Mechanics of Nanomaterials and Micro/Nanodevices-VII

Room: W2-68

Session Chairs: Xiaodong Li, University of South Carolina; T. Balk, University of Kentucky

8:30 AM

Introductory Remarks

8:40 AM

Nanomechanical Properties of Piezoelectric Actuator Materials

A. Romasco*, P. Bintachitt, L. Fang, The Pennsylvania State University, USA; R. Polcawich, J. Pulskamp, M. Dubey, Army Research Laboratory, USA; S. Troler-McKinstry, L. Friedman, C. L. Muhstein, The Pennsylvania State University, USA

9:00 AM

Nanomechanical Characterization of Polyaniline Coated Tobacco Mosaic Virus Nanotubes

X. Wang, Z. Niu, S. Li, Q. Wang, X. Li*, University of South Carolina, USA

9:20 AM

Wear Behavior of Nanocrystalline Materials (Invited)

E. I. Meletis*, University of Texas at Arlington, USA

10:00 - 10:20 a.m.

Break

10:20 AM

Quantitative Load Transfer Analysis in Carbon Nanotube Composites using Polarized Raman Spectroscopy

J. B. Bult*, L. Schadler, P. Ajayan, Rensselaer Polytechnic Institute, USA

10:40 AM

Mechanical and Impact Properties of Carbon-Nanotube-Reinforced Amorphous Silicon Carbide Composites via Atomistic Simulation Studies

M. A. Makeev*, D. Srivastava, NASA Ames Research Center, USA

11:00 AM

Mechanical Behavior of Nanoporous Noble Metal Thin Films

Y. Sun, University of Kentucky, USA; J. Ye, National Center for Electron Microscopy, USA; Z. Shan, Hysitron Inc., USA; A. M. Minor, National Center for Electron Microscopy, USA; T. J. Balk*, University of Kentucky, USA

Processing and Product Manufacturing: Innovative Processing and Synthesis of Ceramics, Glasses and Composites

Spark Plasma Sintering, Reaction Forming and Mechanical Alloying

Room: O2-33

Session Chair: Waltraud Kriven, University of Illinois at Urbana-Champaign

8:30 AM

Introductory Remarks

8:40 AM

Spark Plasma Sintering of Ceramic Powders: Process Assessment and Densification Mechanisms (Invited)

R. Chaim*, A. Shlayer, Technion - Israel Institute of Technology, Israel

9:20 AM

Introduction of an Emerging Compaction Technology – Spark Plasma Sintering (SPS)

R. Aalund*, Metal Processing Systems, Inc., USA

9:40 AM

Spark-Plasma Sintering: Analysis of Shrinkage Kinetics

E. A. Olevisky*, San Diego State University, USA

10:00 - 10:20 a.m.

Break

10:20 AM

Geopolymer-derived Ceramics Based on Less Contaminated, Synthetic Analogues of Fly-Ash (Invited)

W. M. Kriven*, P. E. Driemeyer, J. L. Bell, University of Illinois at Urbana-Champaign, USA

11:00 AM

Processing and Properties of Nickel Titanate Titanide Composites by Reactive Sintering

M. Snel*, Technische Universiteit Eindhoven, Netherlands; J. Luyten, F. Snijders, Flemish Institute for Technological Research (VITO), Belgium; S. Kodentsov, B. de With, Technische Universiteit Eindhoven, Netherlands

11:20 AM

Experimental Examination of a Possible Eutectic in Composite Al₂O₃-TiB₂: Preliminary Results

S. Rolt*, K. V. Logan, Virginia Tech, USA

11:40 AM

Processing and Characterization of Mechanically Alloyed Al/MgB₂ Composites

J. R. Vezquez*, L. Reyes-Russi, O. Suarez, University of Puerto Rico, Puerto Rico

Processing and Product Manufacturing: Joining of Advanced and Specialty Materials IX

Solid-State Joining Processes

Room: O2-35

Session Chairs: Thomas Lienert, Los Alamos National Lab; Leijun Li, Utah State University

8:30 AM

Introductory Remarks

8:40 AM

Mechanics of Resistance Projection Welding (Invited)

J. E. Gould*, Edison Welding Institute, USA

9:20 AM

Microstructural Characterization of Ultrasonic Spot Welds in Automotive Aluminum Alloys

R. Jahn*, D. Wilkosz, J. Baer, L. Reatherford, A. Grima, S. Ward, W. Donlon, Ford Motor Company, USA

9:40 AM

Initial Evaluation of Spring-Opposed Retractable Pin Tool for FSW

D. H. Lammlein*, D. Delapp, A. M. Strauss, Vanderbilt University, USA; T. J. Lienert, Los Alamos National Lab, USA; G. E. Cook, P. Flemming, T. S. Bloodworth, T. Prater, M. Wilkes, Vanderbilt University, USA; M. Bement, Los Alamos National Lab, USA

10:00 - 10:20 a.m.

Break

10:20 AM

Application of Ultrasonic Peening in Manufacturing, Rehabilitation and Repair of Welded Elements and Structures

Y. Kudryavtsev*, J. Kleiman, ITL Inc., Canada

Thursday AM

10:40 AM

Fabrication and Characterization of Diffusion Bonds for Silicon Carbide to Silicon Carbide Joining

M. Halbig*, Army Research Laboratory, USA; M. Singh, Ohio Aerospace Institute, USA; L. M. Cosgriff, R. E. Martin, Cleveland State University, USA

11:00 AM

Mechanical and Metallurgical Properties and Forces of Immersed Friction Stir Welding of AA6061-T6

T. S. Bloodworth*, P. A. Fleming, T. Prater, D. H. Lammlein, G. E. Cook, A. M. Strauss, M. Wilkes, D. DeLapp, Vanderbilt University, USA; T. J. Lienert, M. Bement, Los Alamos National Laboratory, USA

11:20 AM

Automatic Fault Detection in Friction Stir Welding

P. Fleming*, M. Wilkes, T. Bloodworth, G. Shearer, G. Cook, A. Strauss, D. DeLapp, Vanderbilt University, USA; T. J. Lienert, M. Bement, Los Alamos National Laboratory, USA; T. Prater, D. Lammlein, Vanderbilt University, USA

11:40 AM

Studies of Material Behavior during Magnetic Pulse Welding

Y. Zhang*, The Ohio State University, USA; P. Zhang, S. Babu, Edison Welding Institute, USA; G. Daehn, The Ohio State University, USA

Processing and Product Manufacturing: Lead-Free Solders: Emerging Issues in Manufacturing, Performance and Reliability

Pb-Free Solder Alloys: Reliability and Mechanical Properties

Room: O2-42

Session Chairs: Carol Handwerker, Purdue University; Iver Anderson, Ames Laboratory

8:30 AM

Introductory Remarks

8:40 AM

Creep Behavior of Environmentally-Benign Pb-free Solders (Invited)

N. Chawla*, R. Sidhu, Arizona State University, USA

9:20 AM

Effect of Drop-Impact Damage on Deformation Behavior of SnAgCuRE Alloy

W. Xiao*, Y. Shi, Y. Lei, Z. Xia, F. Guo, Beijing University of Technology, China

9:40 AM

Nanoindentation Creep Properties of Thin-Joint Intermetallics of Pb-free Solders

J. P. Lucas*, M. Wilson, Michigan State Univ., USA

10:00 - 10:20 a.m.

Break

10:20 AM

Recrystallization and Crack Nucleation at Corners in Thermomechanically Cycled Lead Free Solder Joints (Invited)

T. R. Bieler*, Michigan State University, USA; E. J. Cotts, Binghamton University, USA

11:00 AM

Shear Strength and Impact Strength of Sn-3.5Ag (-Co) Solder/Cu Joint

H. Nishikawa*, K. Miki, T. Takemoto, Osaka University, Japan

11:20 AM

Massive Spalling of Intermetallic Compound in Solder Joints (Invited)

C. Kao*, National Taiwan University, Taiwan

12:00 PM

Electrothermal Effect on the Impression Behavior of a Sn-based Alloy

R. Chen*, F. Yang, University of Kentucky, USA

Steel: Steel Product Metallurgy and Applications

Product Metallurgy II

Room: W2-70

Session Chair: John Speer, Colorado School of Mines

8:30 AM

Introductory Remarks

8:40 AM

Microstructure and Properties of Cold-Rolled-and-Annealed Low-Carbon Manganese TRIP Steels

M. Merwin*, United States Steel - Research, USA

9:00 AM

Mechanical Behavior and Microstructure Characteristics of Trip Steel Plates under Various Heat-Treating Conditions

Q. Tian*, X. Dong, Baosteel Research Institute, China

9:20 AM

Strain Aging Behavior of Bake Hardening Steel for Automotive Application

A. A. Vasilyev*, St. Petersburg State Polytechnical University, Russian Federation; H. Lee, Seoul National University, South Korea; N. L. Kuzmin, St. Petersburg State Polytechnical University, Russian Federation

9:40 AM

Influence of Annealing Conditions on the Electrical Steel Texture Development

S. Shin*, S. Biroasca, S. Chang, D. Bruno C., GIFT, POSTECH, South Korea

10:00 - 10:20 a.m.

Break

10:20 AM

Alternative Mechanism of Secondary Recrystallization in Fe-3%Si Steel: Sub-Boundary Enhanced Solid-State Wetting

D. Lee*, K. Ko, Seoul National University, South Korea; B. Lee, POSTECH, South Korea; J. Park, J. Kim, POSCO, South Korea; N. Hwang, Seoul National University, South Korea

10:40 AM

Deformation Behaviors at Elevated Temperatures in High Silicon Electrical Steels

S. Lee*, B. C. De Cooman, S. Chang, POSTECH, South Korea

11:00 AM

Morphology and Crystallography of Copper Sulfide Precipitated during Isothermal Heat Treatment in Iron Alloy

Z. Liu*, M. Kuwabara, Y. Iwata, Nagoya University, Japan

11:20 AM

Study of the Relationships Between Inclusion Morphology and Reduction Ratio for Bar Products (Invited)

Y. Huang*, Key Safety Systems, Inc., USA; J. Yang, The Cold Heading Company, USA

11:40 AM

Study of Hot Workability of Free-cutting Steels by the SKIZ Technique

C. Revilla, B. Lopez, J. M. Rodriguez-Ibabe*, CEIT, Spain



Automotive: Automotive and Ground Vehicles: Materials and Processes for Vehicles

Stainless and Powder Metals

Room: W2-62

Session Chair: Jean Lynn, DaimlerChrysler

2:00 PM

Introductory Remarks

2:10 PM

Investigation into Alloying Effects of Cast Stainless Steels on High Temperature Mechanical Properties for Automotive Exhaust Manifold Applications

Y. Kim*, H. Shin, H. Park, J. Lim, Hyundai Motor Company, South Korea; K. Lee, Kangnung National University, South Korea; J. Park, Research Institute of Industrial Science & Technology, South Korea; T. Ha, Kangnung National University, South Korea; J. Jung, Research Institute of Industrial Science & Technology, South Korea

2:30 PM

Development of Chrome Core® 13-XP Stainless – A Soft Magnetic Stainless Steel With Improved Corrosion Resistance

M. L. Schmidt*, Carpenter Technology Corporation, USA; D. A. DeAntonio, Carpenter Technology Corp., USA

2:50 PM

Magnesium Powder Metallurgy: Process and Materials Opportunities

C. J. Bettles*, Monash University, Australia

3:10 PM

Recent Advances in the Development of “Press-and-Sinter” Aluminum PM Alloys for Automotive Applications (Invited)

D. P. Bishop*, Dalhousie University, Canada

3:30 - 3:50 p.m.

Break

3:50 PM

Design Benefits of Powder Metallurgy in Highly Loaded Automatic Transmission Applications

S. Kassam*, C. Hammer, Keystone Powdered Metal Company, USA; B. Kline, P. Imbrogno, Keystone Powdered Metal Co., USA

4:10 PM

Advances in PM Manufacturing. Focus on Lean Alloying, High Precision Components, with Wrought Steel Durability (Invited)

R. Lawcock*, Stackpole Ltd, Canada

4:30 PM

Localized Enhancement of Aluminum P/M Components

J. W. Newkirk*, A. Jambunathan, U. of Missouri-Rolla, USA

4:50 PM

Optimizing the Strength of the Materials Used to Manufacture Powder Forged Connecting Rods

E. Ilija*, Metaldyne, USA

Automotive: Automotive Light Metal Castings: Technology and Applications

Microstructure Evolution, Phase Transformation and Light Metal Composites

Room: W2-64

Session Chairs: Ramana Reddy, The University of Alabama; Douglas Matson, Tufts University

2:00 PM

Introductory Remarks

2:10 PM

Processing of Automotive Al alloy /AlN Composites (Invited)

R. G. Reddy*, The University of Alabama, USA

2:50 PM

Refinement of Eutectic Grains/Cells in Near-Eutectic Al-Si Alloys

H. Liao*, H. Wang, M. Zhang, G. Dong, G. Sun, Southeast University, China

3:10 PM

Influence of In-Situ TiB₂ Particles on the Microstructural, Mechanical and Abrasive Wear Behaviour of A356 Alloy

S. Kumar*, S. V. Sarma, B. S. Murty, Indian Institute of Technology Madras, India

3:30 - 3:50 p.m.

Break

3:50 PM

Development and Testing of Chilled Aluminum Alloy-Corundum Particulate Composite for Automotive Applications

K. S. Shekar*, J. Hemanth, Siddaganga Institute of Technology, India

4:10 PM

Fabrication and Characterization of Al/AIB₂ Composites for Machinery Subject to Lunar Regolith Abrasion

R. G. Hidalgo-Hernández*, University of Puerto Rico-Mayagüez, Puerto Rico; O. Suárez, University of Puerto Rico - Mayagüez Campus, Puerto Rico; K. Sridharan, University of Wisconsin - Madison, USA

4:30 PM

Microstructural Evolution of an Al-In Alloy Undergoing Spinodal Decomposition

U. R. Seelam*, University of Central Florida, USA; G. S. Sastry, Institute of Technology, Banaras Hindu University, India

Automotive: High-Density Hydrogen Storage for Automotive Applications: Materials and Methods

Chemical Storage II

Room: W2-66

Session Chair: Scott Jorgensen, General Motors Corp.

2:00 PM

Introductory Remarks

2:10 PM

Amineborane Based Chemical Hydrogen Storage (Invited)

L. G. Sneddon*, M. Bluhm, C. Yoon, L. Alden, D. Himmelberger, U of Pennsylvania, USA; M. G. Bradley, Widener University, USA

2:50 PM

Solid Ammonia Storage Technology for Next Generation Automotive Fuel Cell Systems (Invited)

T. Johannessen*, Amminex A/S, Denmark

3:30 PM

Amine Boranes for Chemical Hydrogen Storage (Invited)

T. Autrey*, D. Camaioni, C. Aardahl, PNNL, USA

4:10 PM

Computational Evaluation of Hydrogen Storage in the NBHx and NBCHx Compounds (Invited)

M. Gutowski*, M. J. Edie, Heriot-Watt University, United Kingdom; J. Li, Pacific Northwest National Laboratory, USA

4:50 PM

Panel Discussion – Physisorptive and Chemical Storage

**Electronic and Magnetic Properties:
Spintronic Materials and Devices**

Spintronic Materials II

Room: D2-10

Session Chair: Sean Li, University of New South Wales

2:20 PM

Introductory Remarks

2:30 PM

Domain Wall Magnetoresistance and Wall Dynamics in Ballistic and Disordered Magnetic Nanowires (Invited)

R. Stamps*, University of Western Australia, Australia

2:50 PM

Large Magnetoresistance in NiMnIn Ferromagnetic Heusler Alloy Single Crystals (Invited)

X. Zhang*, B. Zhang, Hong Kong University of Science and Technology, Hong Kong; S. Yu, J. Chen, Z. Cao, G. Wu, Institute of Physics, China

3:10 PM

Room-temperature Ferromagnetic Zn_{0.95}Co_{0.05}O Diluted Magnetic Semiconducting Thin Films by Hydrothermal Epitaxy

Y. Zhang*, G. Goh, Institute of Materials Research and Engineering, Singapore; S. Li, The University of New South Wales, Australia

3:30 - 3:50 p.m.

Break

3:50 PM

Development of Novel Materials and Hybrid Multilayer Films for Spintronics (Invited)

X. Wang*, University of Wollongong, Australia

4:10 PM

Low Relaxation Rate in Epitaxial Ferromagnetic Ultrathin Films (Invited)

W. Bailey*, Columbia University, USA

4:30 PM

Room Temperature Ferromagnetic Dilute Magnetic Semiconductor Zn_{0.95}Co_{0.05}O

L. Qing*, G. Chee Lip, Nanyang Technological University, Singapore; H. Gu Chang, Data Storage Institute, Singapore

Energy: Fuel Cells: Materials, Processing, Manufacturing and Power Management Technologies

Interconnects of High Temperature Fuel Cells II

Room: D2-14

Session Chairs: Chris Johnson, U.S. Dept. of Energy; Jim Rakowski, Allegheny Technology, Inc.

2:00 PM

Introductory Remarks

2:10 PM

The Influence of Si Content on the Oxidation Behavior of Type 430 Stainless Steel

D. E. Alman*, P. D. Jablonski, National Energy Technology Laboratory, USA

2:30 PM

The Formation of Alumina Coating on Ferritic Steels

R. Bateni*, McMaster University, Canada; L. S. Quintero, Universidad Industrial de Santander, Colombia; A. Petric, McMaster University, Canada

2:50 PM

Filtered Arc PVD Nanocomposite Oxide Coatings for SOFC Interconnects

P. Gannon*, P. White, M. Deibert, R. Smith, H. Chen, Montana State University, USA; V. Gorokhovskiy, Arcomac Surface Engineering, LLC, USA

3:10 PM

Dense Electroconductive Oxide Ceramic Coating on Ferritic Stainless Steel for SOFC Interconnect

D. Park*, J. Choi, Korea Institute of Machinery and Materials, South Korea; H. Lin, Oak Ridge National Laboratory, USA; B. Hahn, W. Yoon, J. Ryu, Korea Institute of Machinery and Materials, South Korea

3:30 PM

Fabrication of Shape Memory Alloy Mesh Using Three Dimensional Printing

N. Yue*, K. Lu, W. Reynolds, C. Story, Virginia Tech, USA

**Fundamentals and Characterization:
Fundamentals of Brittle Fracture**

Applications

Room: D0-03A

Session Chair: Jacob Jones, University of Florida

2:00 PM

Introductory Remarks

2:10 PM

Size Effect in Cleavage Cracking in Polycrystalline Thin Films

Y. Qiao*, J. Chen, UCSD, USA

2:30 PM

Sonic IR Imaging: A New NDE Technology for Finding Cracks and Disbonds

L. D. Favro, X. Han*, G. Newaz, R. L. Thomas, Wayne State University, USA

2:50 PM

Orientation Characterization of Microcracks Formed by Sphere Impact on Titanium Diboride

T. Sano*, H. T. Miller, J. C. LaSalvia, US Army Research Laboratory, USA

Thursday PM

MS&T'07[®]

3:10 PM

Preliminary Investigation of Damage in an Armor-Grade TiB₂ Induced by Quasi-Static Hertzian Indentation

R. McCuiston*, H. Miller, T. Sano, J. LaSalvia, U.S. Army Research Laboratory, USA

3:30 - 3:50 p.m.

Break

3:50 PM

3D Impact Damage Diagnostics with X-ray Computed Tomography

J. Wells*, JMW Associates, USA

4:10 PM

Influence of Residual Stress on Brittle Intergranular Fracture

K. P. Boyle*, Natural Resources Canada, Canada; J. D. Embury, McMaster University, Canada

4:30 PM

Internal Hydrogen Embrittlement of Steels

G. P. Tiwari*, S. Kumar, K. S. Balakrishnan, J. S. Dubey, E. Ramadasan, BARC, India

Fundamentals and Characterization: High Temperature Material Systems: Fatigue Mechanisms and Prognosis

Role of Microstructure and Environment on Fatigue of Ti-based Alloys and Other Structural Alloys

Room: D0-02AB

Session Chairs: Carl Boehlert, Michigan State University; Carlos Engler-Pinto, Ford Motor Company

2:00 PM

Introductory Remarks

2:10 PM

Fatigue of Fibre-Reinforced Titanium Metal Matrix Composites (Invited)

P. Bowen*, Birmingham University, United Kingdom

2:50 PM

Mechanisms of High Cycle Fatigue in an alpha/beta Ti Alloy

A. Polasik, V. Levit, J. Williams, H. L. Fraser*, The Ohio State University, USA

3:10 PM

The Elevated-Temperature Fatigue Behavior of Boron-Modified Ti-6Al-4V(wt.%)

W. Chen, C. J. Boehlert*, Michigan State University, USA

3:30 - 3:50 p.m.

Break

3:50 PM

Relating Microstructural Variability to Fatigue Lifetime Variability in an $\alpha + \beta$ Titanium Alloy

C. Szczepanski*, University of Michigan, USA; S. Jha, Universal Technology Corporation, USA; J. Larsen, Wright-Patterson Air Force Base, USA; J. Jones, University of Michigan, USA

4:10 PM

Thermo-Mechanical Fatigue Analysis of Cast Aluminum Cylinder Heads

C. Engler-Pinto*, J. Allison, X. Su, X. Chen, Ford Motor Company, USA

4:30 PM

Microstructure Effects on Fatigue Crack Path in a Nb-20at.%Si Alloy

Y. Liu*, M. Shazly, J. J. Lewandowski, Case Western Reserve University, USA

4:50 PM

Characterization of Materials for Nuclear Hydrogen Initiative

A. K. Roy*, UNLV, USA

5:10 PM

Mechanical Properties and Microstructure of AlFeSiV-SiC Particulate Composite

M. Arhami*, Eastern Mediterranean University, Turkey

Fundamentals and Characterization: Numerical, Mathematical and Physical Modeling Tools for Materials Processes

Numerical, Mathematical, and Physical Modeling Tools for Materials Processes IV

Room: D0-03D

Session Chairs: Patricio Mendez, Colorado School of Mines; Ben Li, University of Michigan

2:00 PM

Introductory Remarks

2:10 PM

Contribution to Digital Representation of Materials Subjected to Thermo-Mechanical Processing

J. Gawad, L. Madej*, Akademia Gornicza Hutnicza, Poland; P. D. Hodgson, Deakin University, Australia; M. Pietrzyk, Akademia Gornicza Hutnicza, Poland

2:30 PM

Effect of Nozzle Port Clogging on the Behavior of Liquid Steel, Slag and Bubble in Slab Mold

G. Wen*, P. Tang, Y. Wang, Chongqing University, China; Z. Chen, Meishan Iron & Steel Co. of Baosteel (Group), China

2:50 PM

Modeling of Quasicrystal Plastic Deformation of Anisotropic Metals by Means of Their Macromechanical Properties

D. E. Esezobor*, S. A. Balogun, S. O. Adeosun, University of Lagos, Nigeria

Materials and Systems: Coatings as an Enabler of System Performance

Coatings for Fatigue and Wear Applications

Room: O2-38

Session Chair: Mohanty Pravansu, University of Michigan

2:00 PM

Introductory Remarks

2:10 PM

Enhanced Fatigue and Corrosion Resistance of Austenitic Stainless Steels Carburized at Low Temperatures (Invited)

A. H. Heuer*, Case Western Reserve University, USA

2:50 PM

Surface Hardening of Ni-Based Superalloys by Means of Low-Temperature Carburization

R. Sharghi-Moshtaghin*, F. Ernst, G. M. Michal, A. H. Heuer, Case Western Reserve University, USA

3:10 PM

Gas-Phase Nitridation under Kinetic Control - A New Concept for Surface Hardening of Ti-Base Alloys

S. Schmidt, F. Ernst*, G. M. Michal, A. H. Heuer, Case Western Reserve University, USA

Thursday PM

3:30 - 3:50 p.m.

Break

3:50 PM

Microstructure Induced Wear Behavior of NiTi Coating

J. J. Stanasic*, A. Ringler, P. Mohanty, University of Michigan, USA

4:10 PM

Modeling the Influence of Orientation Texture of CVD Coatings on WC-Co Composites

H. Chien*, M. Gao, H. Miller, G. Rohrer, Carnegie Mellon University, USA; Z. Ban, P. Prichard, Y. Liu, Kennametal Inc., USA

4:30 PM

Thick Nano-Structured CVD Coating HARDIDE as Enabler for Engineering Systems in Extreme Wear and Erosion Conditions

Y. Zhuk*, Hardide Plc, United Kingdom

4:50 PM

Equilibrium Partial Pressure of Hydrogen to Achieve Low Friction at Diamond and Diamond-like Carbon Coating Surfaces

H. Guo*, University of South Carolina, USA; Y. Qi, General Motors R&D Tech Center, USA; X. Li, University of South Carolina, USA

Materials and Systems: International Symposium on Ceramic Matrix Composites

UHTCs-II

Room: O2-43

Session Chair: Chen-Feng Kao, National Cheng Kung University

2:00 PM

Introductory Remarks

2:10 PM

Directionally Solidified Eutectic Microstructures via Laser Surface Processing of Non-Oxide Boride Eutectics I

J. F. Foreman*, A. V. Polotai, K. C. Meinert, E. C. Dickey, Pennsylvania State University, USA

2:30 PM

Pressureless Sintering of ZrC-Mo Cermets for Ultra-High Temperature Applications

S. E. Landwehr*, G. E. Hilmas, W. G. Fahrenholtz, University of Missouri - Rolla, USA; I. G. Talmay, Naval Surface Warfare Center - Carderock Division, USA

2:50 PM

Reaction Processing of W-TaC Composites

M. Teague*, S. C. Zhang, G. E. Hilmas, W. G. Fahrenholtz, University of Missouri-Rolla, USA

3:10 PM

Thermal and Electrical Properties of Mo₅Si₃C and Their Effects on SiC-Mo₅Si₃C Ceramics

A. Buchheit*, G. Hilmas, B. Fahrenholtz, University of Missouri-Rolla, USA; D. Deason, U.S. Army Space & Missile Defense Command, USA

Materials and Systems: Next Generation Biomaterials: Advanced Processing, Characterization and Modeling of Materials for Medical Devices

Physical and Mechanical Properties Characterization of Biomaterials, Part II

Room: O2-39

Session Chairs: John Nychka, University of Kentucky; Elizabeth Perepezko, BIOMET Manufacturing Corporation

2:00 PM

Introductory Remarks

2:10 PM

Microstructure and Mechanical Behavior of Biocompatible TiO₂/Ti

G. A. Crawford*, N. Chawla, Arizona State University, USA; J. E. Houston, Sandia National Laboratory, USA

2:30 PM

Multiscale Structures and Mechanical Behaviors of the Biological Structural Material and Bio Inspired Composite Materials for Armor Design Applications

H. Rhee*, Center for Advanced Vehicular Systems (CAVS) at Mississippi State University, USA; M. F. Horstemeyer, Mississippi State University, USA; Y. Hwang, Center for Advanced Vehicular Systems (CAVS) at Mississippi State University, USA; L. Liyanage, Mississippi State University, USA

2:50 PM

Effects of Residual Stress on Dissolution of Bioglass 45S5

D. Li*, J. A. Nychka, University of Kentucky, USA; T. Day, MO-SCI Corporation, USA

3:10 PM

Fracture Behavior of Resin Based Dental Composites

J. J. Kruzic*, M. Shah, Oregon State University, USA; J. L. Ferracane, School of Dentistry, Oregon Health & Science University, USA

3:30 - 3:50 p.m.

Break

3:50 PM

Biologically Derived Conducting Polymers for Integration of Devices with Living Tissue (Invited)

D. Martin*, University of Michigan, USA; S. Richardson-Burns, Biotectix LLC, USA; A. Peramo, University of Michigan, USA; J. Hendricks, Biotectix LLC, USA; L. Povlich, S. Spanninga, J. C. Cho, J. Kim, University of Michigan, USA

4:30 PM

Fabrication and Characterization of a Dense Hydroxyapatite Coating on Titanium Substrate

D. Park*, B. Hahn, J. Choi, W. Yoon, J. Ryu, Korea Institute of Machinery and Materials, South Korea

Nanotechnology: Materials Characterization at the Nanoscale: Instrumentation and Applications

Mechanical Characterization

Room: W2-61

Session Chair: Marc Zupan, UMBC- University of Maryland Baltimore County

2:00 PM

Introductory Remarks

2:10 PM

Surface Mechanical Properties Characterization by Nanoindentation and Nano-Scratch Testing

A. O. Sergici*, N. X. Randall, CSM Instruments, USA

2:30 PM

Determining the Distribution of Damage over the Primary Shear Zone in Metal Cutting Process Using Nanoindentation

M. Saket Kashani*, V. Madhavan, Wichita State University, USA

2:50 PM

High Temperature Nano-Indentation of Single Crystal Ni-Base Super Alloy CMSX-4

A. C. Savant*, S. Tin, Illinois Institute of Technology, USA

3:10 PM

Characterization of Deformation Mechanisms under Nanoindents in Metallic Multilayers

D. Bhattacharyya*, N. Mara, P. Dickerson, A. Misra, R. Hoagland, Los Alamos National Laboratory, USA

3:30 - 3:50 p.m.

Break

3:50 PM

Determination of the Nano-Mechanical Properties of Different Phases of Cement Paste and Interfacial Transition Zone in Concrete

P. Mondal*, L. D. Marks, S. P. Shah, Northwestern University, USA

4:10 PM

Formation of Nano-Grains during Biaxial High Frequency Fully Reversed Loading

K. Johnson*, R. Higginson, Loughborough University, United Kingdom; A. Gupta, Solidica Inc., USA

4:30 PM

Experimental NanoMechanics: A Look at Edge Dislocations in 4HSiC Crystals

F. Sciammarella*, Illinois Institute of Technology, USA; C. Sciammarella, L. Lamberti, Politecnico di Bari, Italy

4:50 PM

Strain Map Interferometric Strain/Displacement Gage (ISDG) Measurements

M. Zupan*, UMBC- University of Maryland Baltimore County, USA

Processing and Product Manufacturing: Innovative Processing and Synthesis of Ceramics, Glasses and Composites

Injection Molding, Tape Casting, Freeze Casting, and Electroforming

Room: O2-33

Session Chair: Stephen Sofie, Montana State University

2:00 PM

Introductory Remarks

2:10 PM

Powder Injection Molding of High Hardness Tungsten Carbides

A. Bose*, Materials Processing, Inc, USA

2:30 PM

Influence of Particle Size, Shape and Distribution on Rheology and Particle Packing of Highly Loaded Al₂O₃ Slurries and Their Sintering Behaviour

C. Treul*, A. Roosen, Institute of Glass and Ceramics, Germany

2:50 PM

Growth and Characterization of Long Range Ordered Pore Structures via Freeze-Tape Casting

S. W. Sofie*, J. McCrummen, S. Codd, K. Romanenko, Montana State University, USA

3:10 PM

In-Situ Fabrication of Porous Silicon Carbide (SiC) Ceramics Incorporated with SiC Nanowires

B. Yoon*, Seoul National University, South Korea; Y. Koh, Catholic University of Daegu, South Korea; C. Park, H. Kim, Seoul National University, South Korea

3:30 PM

Near Room-Temperature Consolidation of Ferroelectric Ceramic Reinforced Multifunctional Metal Matrix Composites by Electroforming

B. D. Poquette*, S. L. Kampe, J. P. Schultz, T. Asare, Virginia Tech, USA

Steel: Steel Product Metallurgy and Applications

Stainless Steels

Room: W2-70

Session Chair: Craig Darragh, Timken Company

2:00 PM

Introductory Remarks

2:10 PM

Microstructure and High-temperature Deformation Behavior of an Oxide Dispersion Strengthened Steel

T. Hayashi*, P. M. Sarosi, The Ohio State University, USA; J. H. Schneibel, Oak Ridge National Laboratory, USA; M. J. Mills, The Ohio State University, USA

2:30 PM

Dispersion Strengthening of σ Phase in Ferritic and Austenitic Stainless Steels after Hot-rolled

C. Hsieh*, National Chung Hsing University, Taiwan; D. Lin, I-Shou University, Taiwan; W. Wu, National Chung Hsing University, Taiwan

2:50 PM

Processing Strategy for Development of Gas Atomized Oxide Dispersion Strengthened Stainless Steel

J. R. Rieken*, I. E. Anderson, Iowa State University, USA; R. L. Terpstra, Ames Laboratory, USA

3:10 PM

Influence of Grain Size and Reverted Austenite on the Mechanical Properties of Stainless Maraging Steels

R. Schnitzer*, H. Leitner, M. Schober, H. Clemens, Montanuniversity of Leoben, Austria; S. Zinner, Boehler Edelstahl GmbH, Austria

3:30 - 3:50 p.m.

Break

3:50 PM

Microstructural Investigation of Stainless Steel AM350 Pulsed Nd-YAG and Fibre Laser Welds

L. M. O'Donoghue*, M. F. Quinlan, P. Phelan, University of Limerick, Ireland

4:10 PM

Microcharacterization of Low-Temperature Gas-Phase Carburization of 316L and 254SMO Austenitic Stainless Steel

A. Avishai*, R. Sharghi-Moshtaghin, H. Kahn, F. Ernst, G. M. Michal, A. H. Heuer, Case Western Reserve University, USA

4:30 PM

Transformation of Ferrite to Austenite during Low Temperature Carburization

G. M. Michal*, X. Gu, F. Ernst, A. H. Heuer, K. Harold, Case Western Reserve University, USA

4:50 PM

Effect of Nitrogen Content and Strain Rate on the Deformation Behavior of the High-Nitrogen Austenitic Steel (18Cr-14Mn-4Ni-3Mo-xN) with Various Nitrogen Contents

S. Nam*, Kookmin University, South Korea; S. Kim, Korea Institute of Machinery and Materials, South Korea; Y. Kim, Kookmin University, South Korea