TMS2014

143rd Annual Meeting & Exhibition

TECHNICAL PROGRAM

February 16-20, 2014 • San Diego Convention Center
San Diego, California, USA

Program At-A-Glance 62
Monday - Technical program 78
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CBMM NORTH AMERICA, INC.

Bringing Niobium Solutions to Industry

CBMM North America, Inc.
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	Day	Time	Building	Room	Page
2014 Aluminum Keynote Session					
"Innovation in the Alumina and Primary Aluminum Industries: How Will We Move on to the Next S-curve?"	MON	8:30 AM	SDCC	6A	78
2014 Functional Nanomaterials: Synthesis, Properties and Applications					
Nanomanufacturing I	MON	8:30 AM	Marriott	Ballroom D	78
Nanomanufacturing II & Fabrication and Fundamentals I	MON	2:00 PM	Marriott	Ballroom D	96
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	252
Fabrication and Fundamentals II & Characterization and Properties I	TUE	8:30 AM	Marriott	Ballroom D	118
Characterization and Properties II & Carbon Nanomaterials I	TUE	2:00 PM	Marriott	Ballroom D	140
Carbon Nanomaterials II & Computational Studies on Nanomaterials	WED	8:30 AM	Marriott	Ballroom D	163
Magnetic Nanomaterials	WED	2:00 PM	Marriott	Ballroom D	185
Applications of Nanomaterials I	THU	8:30 AM	Marriott	Ballroom D	208
Applications of Nanomaterials II & Energy Nanomaterials	THU	2:00 PM	Marriott	Ballroom D	232
2014 Materials and Manufacturing Innovation					
World Views on Materials and Manufacturing Innovation: Regional Perspectives from Government Organizations	TUE	8:30 AM	SDCC	6A	118
2014 TMS RF Mehl Medal Symposium on Frontiers in Nanostructured Materials and Their Applications					
Keynote Session on Nanomaterials, General Properties and Others	MON	8:30 AM	Marriott	Ballroom E	78
Keynote Session on Nanomaterials and Applications	MON	2:00 PM	Marriott	Ballroom E	97
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	252
Nanoceramics I--Nanostructured Ceramics-oxides and Thin Film Interfaces	TUE	8:30 AM	Marriott	Ballroom E	119
Nanometals I-Twinning and Interfacial Effects for Application	TUE	2:00 PM	Marriott	Ballroom E	141
Nanometals II-Processing and Strengthening Mechanisms	WED	8:30 AM	Marriott	Ballroom E	163
Nanomaterials for Device Applications and Nanometal III-Deformation Mechanisms	WED	2:00 PM	Marriott	Ballroom E	186
Nanomaterials for Energy Applications and Carbon Related Materials	THU	8:30 AM	Marriott	Ballroom E	208
5th International Symposium on High Temperature Metallurgical Processing					
High Efficiency New Metallurgical Technology	MON	8:30 AM	SDCC	18	79
Alloy and Materials Preparation	MON	2:00 PM	SDCC	18	97
Fundamental Research of Metallurgical Process	TUE	8:30 AM	SDCC	18	119

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Roasting, Reduction and Smelting	TUE	2:00 PM	SDCC	18	141
Sintering of Ores and Powder	WED	8:30 AM	SDCC	18	164
Simulation and Modeling	WED	2:00 PM	SDCC	18	186
Treatment of Solid Slag/Wastes and Complex Ores	THU	8:30 AM	SDCC	18	209
Microwave Heating, Energy and Environment	THU	2:00 PM	SDCC	18	232

"A Lifetime of Experience with Titanium Alloys: An SMD Symposium in Honor of Jim Williams, Mike Loretto and Rod Boyer"

Williams Honorary Session I: Processing Science	MON	8:30 AM	SDCC	1A	79
Williams Honorary Session II: Fatigue I	MON	2:00 PM	SDCC	1A	98
Loretto Honorary Session I: Phase Stability	TUE	8:30 AM	SDCC	1A	120
Loretto Honorary Session II: Fatigue II & Advanced Fabrication	TUE	2:00 PM	SDCC	1A	142
Boyer Honorary Session I: Environmental Effects	WED	8:30 AM	SDCC	1A	164
Boyer Honorary Session II: Structure/Property Correlations	WED	2:00 PM	SDCC	1A	187
General Abstracts	THU	8:30 AM	SDCC	1A	209

Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Modeling

Ion Beam Irradiation	MON	8:30 AM	SDCC	33B	80
Ion Beam Irradiation and Advanced Characterization Techniques	MON	2:00 PM	SDCC	33B	98
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	253
Simulation and Modeling	TUE	8:30 AM	SDCC	33B	120
In-situ TEM and Materials Testing Environmental Interactions and Programmatic Aspects	TUE	2:00 PM	SDCC	33B	142
Irradiation Studies in Reactors	WED	8:30 AM	SDCC	32B	165
Fuels	WED	2:00 PM	SDCC	33C	187

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms

Characterization of Strain	MON	8:30 AM	SDCC	8	80
Dislocations and Plasticity	MON	2:00 PM	SDCC	8	99
Poster Session	MON	6:30 PM	SDCC	8	254
Strain and Plasticity	TUE	8:30 AM	SDCC	8	121
Advanced Materials and HCP Metals	TUE	2:00 PM	SDCC	8	143
Strain and Plasticity II	WED	8:30 AM	SDCC	8	165

Advanced Composites for Aerospace, Marine, and Land Applications

Processing and Design of Composites	MON	8:30 AM	SDCC	6F	81
Characterization of Composite Microstructures and Phases	MON	2:00 PM	SDCC	6F	99
Mechanical and Material Property Evaluation	TUE	8:30 AM	SDCC	6F	121
Interface and Bonding of Composite Systems	TUE	2:00 PM	SDCC	6F	143

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Advanced Materials for Power Electronics, Power Conditioning, and Power Conversion II					
Advanced Materials for Power Electronics, Power Conversion, and Power Conditioning	MON	8:30 AM	Marriott	Cardiff	81
Capacitor and Dielectric Materials	MON	2:00 PM	Marriott	Cardiff	100
Wide Bandgap Semiconductors Materials Growth and Characterization	TUE	8:30 AM	Marriott	Cardiff	122
Wide Bandgap Semiconductors Device Processing and Characterization	TUE	2:00 PM	Marriott	Cardiff	144
High Performance Soft Magnets I (This is a joint session with Magnetic Materials for Energy Applications IV)	WED	2:00 PM	Marriott	Cardiff	188
High Performance Soft Magnets II (This is a joint session with Magnetic Materials for Energy Applications IV)	THU	8:30 AM	Marriott	Cardiff	210
Advanced Materials in Dental and Orthopedic Applications					
Next Generation Biomaterials for Prosthodontics and Orthopedics	MON	2:00 PM	SDCC	32B	100
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	254
Physical and Mechanical Properties of Orthopedic/Dental Materials	TUE	2:00 PM	SDCC	33A	144
Corrosion and Tribocorrosion Behavior of Orthopedic/Dental Materials	WED	2:00 PM	SDCC	32B	188
Bone/Dental Implants with Enhanced Biomedical Performance	THU	8:30 AM	SDCC	32B	210
Dental and Orthopedic Composites	THU	2:00 PM	SDCC	1A	233
Advances in Surface Engineering: Alloyed and Composite Coatings III					
Mechanical, Wear, and Corrosion Properties of Coatings	MON	8:30 AM	SDCC	1B	81
Laser Processing, Thermal Spraying, and Friction Stir Processing of Coatings	MON	2:00 PM	SDCC	1B	101
High Temperature Coatings	TUE	8:30 AM	SDCC	1B	122
Electrochemical and Low Temperature Processing of Coatings	TUE	2:00 PM	SDCC	1B	144
Joint Session I: Recent Developments in Biological, Electronic, and Functional Thin Films and Coatings	WED	8:30 AM	SDCC	1B	166
Joint Session II: Recent Developments in Biological, Electronic, and Functional Thin Films and Coatings	WED	2:00 PM	SDCC	1B	189
Algorithm Development in Computational Materials Science and Engineering					
Algorithms for Lower Length Scale Modeling: Ab Initio, Atomistics and Materials Chemistry: Part I	MON	8:30 AM	SDCC	31B	82
Algorithms for Lower Length Scale Modeling: Ab Initio, Atomistics and Materials Chemistry: Part II	MON	2:00 PM	SDCC	31B	101
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	255
Towards Higher Length Scales: Mesoscale Modeling and Scale Bridging: Part I	TUE	8:30 AM	SDCC	31B	123
Towards Higher Length Scales: Mesoscale Modeling and Scale Bridging: Part II	TUE	2:00 PM	SDCC	31B	145
Algorithms for General Materials Modeling and Integrating Experiments: Part I	WED	8:30 AM	SDCC	31B	166

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Algorithms for General Materials Modeling and Integrating Experiments: Part II	WED	2:00 PM	SDCC	31B	189
Alloys and Compounds for Thermoelectric and Solar Cell Applications II					
Alloys and Compounds for Thermoelectric and Solar Cell Applications: Thermoelectric I	WED	8:30 AM	Marriott	Cardiff	167
Alloys and Compounds for Thermoelectric and Solar Cell Applications: Thermoelectric II	WED	2:00 PM	Marriott	Cardiff	190
Alloys and Compounds for Thermoelectric and Solar Cell Applications: Thermoelectric III	THU	8:30 AM	Marriott	Cardiff	211
Alumina and Bauxite					
Bayer Process/Quality	MON	2:00 PM	SDCC	15B	101
Process Control	TUE	8:30 AM	SDCC	15B	123
Cost Reduction/Alumina Recovery	TUE	2:00 PM	SDCC	15B	146
Non-bayer Process	WED	8:30 AM	SDCC	15B	167
Waste Recovery	WED	2:00 PM	SDCC	15B	190
Aluminum Alloys: Development, Characterization and Applications					
Development and Application	MON	2:00 PM	SDCC	12	102
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	255
Processing, Texture and Formability	TUE	8:30 AM	SDCC	12	123
Solutioning and Aging Behaviors	TUE	2:00 PM	SDCC	12	146
Corrosion and Fatigue	WED	8:30 AM	SDCC	12	168
Material Characterization and Modeling	WED	2:00 PM	SDCC	12	191
Emerging Technologies	THU	8:30 AM	SDCC	12	211
Aluminum Processing					
Aluminum Processing: Rolling & Twin-Roll Casting	MON	2:00 PM	SDCC	13	102
Aluminum Processing: Extrusion & Miscellaneous Processes	TUE	8:30 AM	SDCC	13	124
Aluminum Reduction Technology					
Potline Operations - Cell Operations	MON	2:00 PM	SDCC	14A	103
Cell Design and Performance	MON	2:00 PM	SDCC	14B	103
Cell Design and Performance - Cathodes and Anodes Joint Session with Electrode Technology	TUE	8:30 AM	SDCC	14A	124
Environment I	TUE	2:00 PM	SDCC	13	146
Fundamentals - Chemistry	TUE	2:00 PM	SDCC	14A	147
Environment II	WED	8:30 AM	SDCC	13	168
Fundamentals - Modelling	WED	8:30 AM	SDCC	14A	168
Potline Operations- Equipment	WED	2:00 PM	SDCC	14A	192
Fundamentals - Electrochemistry and New Processes	WED	2:00 PM	SDCC	13	191
Potline Operations- Control	THU	2:00 PM	SDCC	14A	233
Biological Materials Science Symposium					
Mechanical Behavior of Biological Materials I: Bone and Teeth (In Honor of Professor Robert O. Ritchie, the 2014 Acta Materialia Gold Medal Award Winner)	MON	8:30 AM	SDCC	33A	82

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Mechanical Behavior of Biological Materials II: Natural Materials	MON	2:00 PM	SDCC	33A	103
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	256
Multi-scale Characterization and Modeling of Biological Materials (Joint session with Characterization of Minerals, Metals and Materials 2014 Symposium)	TUE	8:30 AM	SDCC	33A	125
Bio-mimetic and Bio-inspired Materials Synthesis	WED	8:30 AM	SDCC	33A	169
Multi-functional Surfaces and Interfaces (Joint session with Characterization of Minerals, Metals and Materials 2014 Symposium)	WED	2:00 PM	SDCC	33A	192
Molecular, Cellular and Tissue Engineering	THU	8:30 AM	SDCC	33A	212
Biomedical Materials, Implants and Applications	THU	2:00 PM	SDCC	33A	234
Bulk Metallic Glasses XI					
Alloy Development and Applications I	MON	8:30 AM	SDCC	2	83
Structures and Mechanical Properties I	MON	2:00 PM	SDCC	2	104
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	256
Structures and Mechanical Properties II	TUE	8:30 AM	SDCC	2	125
Fatigue and Other Properties	TUE	2:00 PM	SDCC	2	147
Alloy Development and Applications II	WED	8:30 AM	SDCC	2	169
Simulation and Modeling	WED	2:00 PM	SDCC	2	192
Structures and Mechanical Properties III	THU	8:30 AM	SDCC	2	213
Structure and Modeling	THU	8:30 AM	SDCC	1B	212
Mechanical and other Properties	THU	2:00 PM	SDCC	2	234
Cast Shop for Aluminum Production					
Macrosegregation and DC Casting	MON	2:00 PM	SDCC	15A	104
Recycling/Cast Shop	TUE	8:30 AM	SDCC	15A	126
Grain Refinement/Solidification	TUE	2:00 PM	SDCC	15A	148
Metal Treatment	WED	8:30 AM	SDCC	15A	169
Furnaces and Energy	WED	2:00 PM	SDCC	15A	193
General Cast Shop	THU	8:30 AM	SDCC	15A	213
"Celebrating the Megascale: An EPD Symposium in Honor of David G.C.Robertson"					
Keynote Session	MON	8:30 AM	SDCC	16A	83
Ferro-Alloys	MON	2:00 PM	SDCC	16A	105
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	256
Non-Ferrous Smelting, Converting, and Refining	TUE	8:30 AM	SDCC	16A	126
Iron and Steel Production	TUE	2:00 PM	SDCC	16A	148
Process Modeling and Simulation	WED	8:30 AM	SDCC	16A	170
Metallurgical Education	WED	2:00 PM	SDCC	16A	193
Pyrometallurgy Process Fundamentals I	THU	8:30 AM	SDCC	16A	213

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Pyrometallurgy Process Fundamentals II	THU	2:00 PM	SDCC	16A	235
Pyrometallurgy Process Fundamentals III	THU	2:00 PM	SDCC	13	235
Characterization of Minerals, Metals and Materials 2014					
Characterization of Ceramics and Clays	MON	8:30 AM	SDCC	7A	84
Characterization of Composites	MON	2:00 PM	SDCC	7A	105
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	257
Characterization of Environmental Materials	TUE	8:30 AM	SDCC	7A	126
Characterization of Non Ferrous Metals	TUE	2:00 PM	SDCC	7A	149
Characterization of Ferrous Metals	WED	8:30 AM	SDCC	7A	171
Characterization of Material Processing	WED	2:00 PM	SDCC	7A	194
Characterization in Material Extraction	THU	8:30 AM	SDCC	7A	214
Characterization of Soft Materials I	THU	8:30 AM	SDCC	7B	214
Characterization of Minerals	THU	2:00 PM	SDCC	1B	235
Method Development in Characterization	THU	2:00 PM	SDCC	7A	236
Characterization of Soft Materials II	THU	2:00 PM	SDCC	7B	236
Computational Discovery of Novel Materials					
Methodologies and Application for Materials Discovery	WED	2:00 PM	SDCC	31A	194
Physical Properties of New Materials	THU	8:30 AM	SDCC	31A	215
Optimization, Validation, and Application of Empirical Potentials	THU	2:00 PM	SDCC	31A	237
Computational Modeling and Simulation of Advanced Materials for Energy Applications					
Starting from Quantum Mechanics	MON	8:30 AM	Marriott	Mission Hills	84
Quantum to Atomistic Simulations	MON	2:00 PM	Marriott	Mission Hills	105
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	258
MGI, ICME and Education (This is a joint session with Energy Technologies and Carbon Dioxide Management Symposium)	TUE	8:30 AM	Marriott	Mission Hills	127
Continuum Modeling and Beyond	TUE	2:00 PM	Marriott	Mission Hills	149
Computational Thermodynamics and Kinetics					
In Honor of Dr. Mark Asta, EMPMD Outstanding Scientist: Session I	MON	8:30 AM	SDCC	30D	85
In Honor of Dr. Mark Asta, EMPMD Outstanding Scientist: Session II	MON	2:00 PM	SDCC	30D	106
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	258
Thermodynamics and Kinetics	TUE	8:30 AM	SDCC	30D	127
First-principles Calculations	TUE	2:00 PM	SDCC	30D	150
Phase-field Simulations	WED	8:30 AM	SDCC	30D	171
Phase-field Simulations/Molecular Dynamics	WED	2:00 PM	SDCC	30D	194
Plasticity/Alloy/Grain Growth/Grain Boundary Properties	THU	8:30 AM	SDCC	30D	215

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Battery/Oxides/Steel/Alloy	THU	2:00 PM	SDCC	30D	237
Data Analytics for Materials Science and Manufacturing					
The Business of Data Analytics	MON	8:30 AM	SDCC	15B	85
Emerging Big Data Opportunities in Materials Science	TUE	8:30 AM	SDCC	32B	128
Inverse and Forward Modeling	TUE	2:00 PM	SDCC	32B	150
Inverse Methods II: Reduced Order Modeling	WED	2:00 PM	SDCC	30E	195
Topology, Graph Theory, and Data Fusion	THU	8:30 AM	SDCC	30E	216
Microstructure Quantification	THU	2:00 PM	SDCC	30E	237
Deformation, Damage, and Fracture of Light Metals and Alloys III					
Al Alloys	MON	2:00 PM	SDCC	19	106
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	259
Mg Alloys	TUE	8:30 AM	SDCC	19	128
Al-Mg and Other Alloys	TUE	2:00 PM	SDCC	19	150
Modelings	WED	8:30 AM	SDCC	19	172
Ti Alloys	WED	2:00 PM	SDCC	19	195
"Dynamic Behavior of Materials VI – An SMD Symposium in Honor of Professor Marc Meyers"					
Shock-Compression of Materials	MON	8:30 AM	SDCC	3	85
High-Strain-Rate Effects in Heterogeneous Materials	MON	2:00 PM	SDCC	3	107
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	259
Simulations and Modeling of Phase Transformations and Reactions	TUE	8:30 AM	SDCC	3	128
High Strain Rate Effects on Shear Localization	TUE	2:00 PM	SDCC	3	151
Shock-Induced Deformation and Failure	WED	8:30 AM	SDCC	3	172
High-Strain-Rate Deformation Mechanisms	WED	2:00 PM	SDCC	3	196
Heterogeneous and Brittle Materials	THU	8:30 AM	SDCC	3	216
Mechanical Properties	THU	2:00 PM	SDCC	3	238
Electrode Technology for Aluminium Production					
Anode Raw Materials	MON	4:00 PM	SDCC	14B	107
Paste Plant Operations	TUE	8:30 AM	SDCC	14B	129
Bake Furnace Design and Operation	TUE	2:00 PM	SDCC	14B	151
Anode Quality and Performance	WED	8:30 AM	SDCC	14B	172
Cathode Materials and Wear	WED	2:00 PM	SDCC	14B	196
Rodding Operation and Anode Electrical Connections	THU	8:30 AM	SDCC	14B	217
Inert Anodes, Cathode Design and Alternative Processes	THU	2:00 PM	SDCC	14B	238
EMPMD 2014 Technical Division Student Poster Contest					
Poster Judging	MON	3:30 PM	SDCC	Sails Pavilion	259
EMPMD 2014 Technical Division Young Professional Poster Contest					
Posters	MON	6:30 PM	SDCC	Sails Pavilion	260

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Energy Technologies and Carbon Dioxide Management					
Alternative Green Processes	MON	8:30 AM	Marriott	Balboa	86
Energy in Iron and Steel	MON	2:00 PM	Marriott	Balboa	107
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	260
MGI, ICME and Education (This is a joint session with the Computational Modeling and Simulation of Advanced Materials for Energy Applications symposium)	TUE	8:30 AM	Marriott	Mission Hills	130
Carbon Dioxide Management	TUE	8:30 AM	Marriott	Balboa	129
Novel Technologies and Life Cycle Assessment	TUE	2:00 PM	Marriott	Balboa	151
Energy Efficiency and Furnace Technologies	WED	8:30 AM	Marriott	Balboa	173
EPD 2014 Technical Division Student Poster Contest					
Poster Judging	MON	3:30 PM	SDCC	Sails Pavilion	260
EPD 2014 Technical Division Young Professional Poster Contest					
Posters	MON	6:30 PM	SDCC	Sails Pavilion	260
Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention					
Emerging Technologies for Data-driven Fatigue Descriptions	MON	8:30 AM	SDCC	7B	86
Microstructure-sensitive and Multiscale Modeling of Fatigue	MON	2:00 PM	SDCC	7B	108
Microstructure-properties-fatigue Relationships	TUE	8:30 AM	SDCC	7B	130
Characterization and Modeling of Fatigue Crack Initiation and Growth	TUE	2:00 PM	SDCC	7B	152
Fatigue Investigations of Novel Materials	WED	8:30 AM	SDCC	7B	173
Design Against Fatigue and Fatigue Property Enhancement	WED	2:00 PM	SDCC	7B	196
Environmental-temperature Effects on Fatigue and Life Prediction	THU	2:00 PM	SDCC	10	239
Fluidization Technologies for the Mineral, Materials, and Energy Industries					
Fluidization Technologies for the Mineral, Materials, and Energy Industries	MON	8:30 AM	SDCC	17B	87
Gamma TiAl Alloys 2014					
Session I	MON	8:30 AM	SDCC	6B	87
Session II	MON	2:00 PM	SDCC	6B	108
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	261
Session III	TUE	8:30 AM	SDCC	6B	130
Session IV	TUE	2:00 PM	SDCC	6B	152
Session V	WED	8:30 AM	SDCC	6B	174
Session VI	WED	2:00 PM	SDCC	6B	197
Session VII	THU	8:30 AM	SDCC	6B	217
Session VIII - Panel Discussion	THU	2:00 PM	SDCC	6B	239
General Recycling					
General Recycling Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	261

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High-temperature Gamma (f.c.c.) /Gamma-Prime (L12 structure) Co-Al-W Based Superalloys					
Diffusion Behavior and Phase Equilibria	MON	8:30 AM	SDCC	5A	87
Oxidation and Alloying Effects on Mechanical Behavior	MON	2:00 PM	SDCC	5A	108
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	262
Processing, Deformation and Interfaces	TUE	8:30 AM	SDCC	5A	131
Defects and Microstructural Evolution	TUE	2:00 PM	SDCC	5A	153
High-temperature Material Systems for Energy Conversion and Storage					
High Temperature Separation Membranes & Energy Conversion Materials	MON	8:30 AM	Marriott	Carlsbad	88
Solid Oxide Fuel Cells I	MON	2:00 PM	Marriott	Carlsbad	109
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	262
Solid Oxide Fuel Cells II	TUE	8:30 AM	Marriott	Carlsbad	131
"Hume-Rothery Award Symposium: Thermodynamics and Kinetics of Engineering Materials"					
Thermodynamic Modeling and Phase Diagrams	MON	8:30 AM	SDCC	6C	88
Thermodynamic and Kinetic Modeling and Experiments	MON	2:00 PM	SDCC	6C	109
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	262
Light Alloy Systems	TUE	8:30 AM	SDCC	6C	132
Iron-base Systems	TUE	2:00 PM	SDCC	6C	153
Materials Systems for Energy	WED	8:30 AM	SDCC	6C	174
ICME: Linking Microstructure to Structural Design Requirements					
ICME: Linking Microstructure to Structural Design Requirements I	MON	8:30 AM	SDCC	31A	89
ICME: Linking Microstructure to Structural Design Requirements II	MON	2:00 PM	SDCC	31A	110
ICME: Linking Microstructure to Structural Design Requirements III	TUE	8:30 AM	SDCC	31A	132
ICME: Linking Microstructure to Structural Design Requirements IV	TUE	2:00 PM	SDCC	31A	153
ICME: Linking Microstructure to Structural Design Requirements- V	WED	8:30 AM	SDCC	31A	175
Integration of Materials Science and Nondestructive Evaluation for Materials Characterization					
Quantitative Nondestructive Characterization I	WED	2:00 PM	SDCC	8	197
Quantitative Nondestructive Characterization II: Titanium Alloys	THU	8:30 AM	SDCC	8	218
Quantitative Nondestructive Characterization III	THU	2:00 PM	SDCC	8	239
Length Scaling of Lamellar and Patterned Microstructures During Solid-Solid Phase Transformations and Solidification					
Nucleation and Crystallographic Effects	MON	8:30 AM	SDCC	32A	89
Dendrites	TUE	8:30 AM	SDCC	32A	132
Eutectics	WED	8:30 AM	SDCC	32A	175

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Growth Kinetics and Precipitate Morphology	THU	8:30 AM	SDCC	32A	218
Light-metal Matrix (Nano)-composites					
Microstructure-Property Relationships I	MON	2:00 PM	SDCC	17B	110
Microstructure-Property Relationships II: Modeling and Advanced Characterization	TUE	8:30 AM	SDCC	17B	133
Emerging Processes	TUE	2:00 PM	SDCC	17B	154
In-situ Synthesis and Novel Additions	WED	2:00 PM	SDCC	16B	198
LMD 2014 Technical Division Student Poster Contest					
Poster Judging	MON	3:30 PM	SDCC	Sails Pavilion	262
LMD 2014 Technical Division Young Professional Poster Contest					
Posters	MON	6:30 PM	SDCC	Sails Pavilion	263
Long-term Stability of High Temperature Materials					
Phase Changes in Bulk Material	MON	8:30 AM	SDCC	4	89
Phase Changes in Bulk Material II and Surface Degradation	MON	2:00 PM	SDCC	4	110
Surface Degradation II and Exposure Effects on Mechanical Behavior	TUE	8:30 AM	SDCC	4	133
Magnesium Technology 2014					
Keynote Session	MON	8:30 AM	SDCC	17A	90
Powders, Recycling, Hydrometallurgy, Primary Production, and Creep	MON	2:00 PM	SDCC	17A	111
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	263
Deformation I	TUE	8:30 AM	SDCC	17A	134
Deformation II	TUE	2:00 PM	SDCC	17A	154
Melting, Modelling, and Solidification	WED	8:30 AM	SDCC	17A	175
Texture and Wrought Processing I	WED	2:00 PM	SDCC	17A	198
Corrosion and Coatings	THU	8:30 AM	SDCC	19	219
Wrought Processing II and Joining	THU	8:30 AM	SDCC	17A	219
Biomedical Applications	THU	2:00 PM	SDCC	19	240
Alloy Design	THU	2:00 PM	SDCC	17A	240
Magnetic Materials for Energy Applications IV					
Rare Earth Permanent Magnets: Processing, Characterization and Modeling	MON	2:00 PM	Marriott	Ballroom G	111
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	264
Rare Earth Free Permanent Magnets	TUE	8:30 AM	Marriott	Ballroom G	134
Fundamentals of the Magnetocaloric Effect and Current Status of Magnetic Cooling Technology	TUE	2:00 PM	Marriott	Ballroom G	155
Magnetocaloric Materials	WED	8:30 AM	Marriott	Ballroom G	176

	Day	Time	Building	Room	Page
High Performance Soft Magnets I (This is a joint session with Advanced Materials for Power Electronics, Power Conditioning and Power Conversion II)	WED	2:00 PM	Marriott	Ballroom G	198
High Performance Soft Magnets II (This is a joint session with Advanced Materials for Power Electronics, Power Conditioning and Power Conversion II)	THU	8:30 AM	Marriott	Ballroom G	220
Materials and Fuels for the Current and Advanced Nuclear Reactors III					
Fuels I	MON	8:30 AM	SDCC	33C	90
Fuels II	MON	2:00 PM	SDCC	33C	112
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	264
Structural Materials I	TUE	8:30 AM	SDCC	33C	135
Structural Materials II	TUE	2:00 PM	SDCC	33C	155
Structural Materials III	WED	8:30 AM	SDCC	33C	176
Structural Materials IV	THU	8:30 AM	SDCC	33C	220
Modeling	THU	2:00 PM	SDCC	33C	241
General	THU	2:00 PM	SDCC	32B	240
Materials Aspects of Corrosion and Fouling in Oil Refining and Exploration					
Session I	WED	8:30 AM	Marriott	Mission Hills	177
Session II	WED	2:00 PM	Marriott	Mission Hills	199
Session III	THU	8:30 AM	Marriott	Mission Hills	221
Materials for High-temperature Applications: Next Generation Superalloys and Beyond					
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	265
Next Generation High-Temperature Materials	TUE	8:30 AM	SDCC	6D	135
Nb- and Ni-Based Alloys	TUE	2:00 PM	SDCC	6D	156
Mo- and Ni-Based Alloys	WED	8:30 AM	SDCC	6D	177
Superalloys	WED	2:00 PM	SDCC	6D	199
Oxidation and Coatings	THU	8:30 AM	SDCC	6D	221
Emerging Materials	THU	2:00 PM	SDCC	6D	241
Materials Processing Fundamentals					
Thermodynamic	MON	8:30 AM	SDCC	11B	91
Process & Properties Control	MON	2:00 PM	SDCC	11B	112
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	265
Metal Extraction	TUE	8:30 AM	SDCC	11B	135
TWIP/Steelmaking	TUE	2:00 PM	SDCC	11B	156
Mechanical Behavior at the Nanoscale II					
In Situ Nanomechanical Testing	MON	8:30 AM	SDCC	9	91
Nanostructured Materials	MON	2:00 PM	SDCC	9	113

	Day	Time	Building	Room	Page
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	266
Size and Rate Effects	TUE	8:30 AM	SDCC	9	136
Multiscale Modeling	TUE	2:00 PM	SDCC	9	157
Nanostructured Composites and Glasses	WED	8:30 AM	SDCC	9	178
Micro/Nano-crystalline Materials	WED	2:00 PM	SDCC	9	200
Fatigue and Nanoindentation	THU	8:30 AM	SDCC	9	222
Length Scale Effects	THU	2:00 PM	SDCC	9	242
Mechanical Behavior Related to Interface Physics II					
Interfacial Effects on Fracture and In situ Straining	MON	2:00 PM	SDCC	11A	113
Interfacial Effects on Radiation Tolerance and Chemical Stability	TUE	2:00 PM	SDCC	11A	157
Twinning Effects on Mechanical Deformation	WED	8:30 AM	SDCC	11A	178
Grain Boundary Effects on Mechanical Deformation	WED	2:00 PM	SDCC	11A	200
Biphase Boundary Effects on Mechanical Response of Composites I	THU	8:30 AM	SDCC	11A	222
Biphase Boundary Effects on Mechanical Response of Composites II	THU	2:00 PM	SDCC	11A	242
Biphase Boundary Effects on Mechanical Response of Composites III	THU	2:00 PM	SDCC	12	243
MPMD 2014 Technical Division Student Poster Contest					
Poster Judging	MON	3:30 PM	SDCC	Sails Pavilion	267
MPMD 2014 Technical Division Young Professional Poster Contest					
Posters	MON	6:30 PM	SDCC	Sails Pavilion	268
Multiscale Approaches to Hydrogen-assisted Degradation of Metals					
Overview of Key Issues & Research Directions	MON	8:30 AM	SDCC	11A	91
Experimental Characterisation of H-assisted Damage	TUE	8:30 AM	SDCC	11A	136
Atomistic Modelling of H-microstructure Interactions	WED	8:30 AM	SDCC	11B	179
Meso & Macro-scale Modelling of H-microstructure Interactions	WED	2:00 PM	SDCC	11B	200
Overcoming HE in Service I / H Diffusion & Trapping	THU	8:30 AM	SDCC	11B	223
Overcoming HE in Service II	THU	2:00 PM	SDCC	11B	243
Multiscale Perspectives on Plasticity in HCP Metals					
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	268
Mechanisms & Microstructures I	WED	2:00 PM	SDCC	6C	201
Mechanisms & Microstructures II	THU	8:30 AM	SDCC	6C	223
Multiscale Modeling	THU	2:00 PM	SDCC	6C	244
Nanoparticulate Materials: Production, Consolidation and Characterization					
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	268
Consolidation I: Field Assisted Sintering	TUE	2:00 PM	Marriott	Carlsbad	158

	Day	Time	Building	Room	Page
Consolidation II: Field Assisted Sintering	WED	8:30 AM	Marriott	Carlsbad	179
Consolidation III: Novel Consolidation Techniques	WED	2:00 PM	Marriott	Carlsbad	201
Particle Synthesis	THU	8:30 AM	Marriott	Carlsbad	224
Novel Synthesis, Processing and Characterization	THU	2:00 PM	Marriott	Carlsbad	244
Nanostructured Materials for Rechargeable Batteries and Supercapacitors II					
Session I	MON	8:30 AM	Marriott	Ballroom F	92
Session II	MON	2:00 PM	Marriott	Ballroom F	114
Session III	TUE	8:30 AM	Marriott	Ballroom F	137
Session IV	TUE	2:00 PM	Marriott	Ballroom F	158
Session V	WED	8:30 AM	Marriott	Ballroom F	179
Session VI	WED	2:00 PM	Marriott	Ballroom F	202
Session VII	THU	8:30 AM	Marriott	Ballroom F	224
Session VIII	THU	2:00 PM	Marriott	Ballroom F	244
Neutron and X-ray Studies of Advanced Materials VII: Challenges of the Future World					
Diffraction Centennial - Historic Perspective and Future Challenges	MON	8:30 AM	SDCC	10	92
Complex Materials	MON	2:00 PM	SDCC	10	114
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	268
Advanced Structural Mapping	TUE	8:30 AM	SDCC	10	137
Stressed Materials	TUE	2:00 PM	SDCC	10	159
Multi-Modal Monitoring of Structure Evolution	WED	8:30 AM	SDCC	10	180
Static and Dynamic Displacements	WED	2:00 PM	SDCC	10	202
Plasticity and Deformation	THU	8:30 AM	SDCC	10	225
Pb-free Solders and Emerging Interconnect and Packaging Materials					
High Temperature Environments	MON	8:30 AM	SDCC	5B	93
Alloying Additions	MON	2:00 PM	SDCC	5B	115
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	269
Issues in 3-D Packages	TUE	8:30 AM	SDCC	5B	138
Electromigration and Flexible Packages	TUE	2:00 PM	SDCC	5B	159
Characterization and Assessment	WED	8:30 AM	SDCC	5B	180
Interfacial Reactions and Fatique	WED	2:00 PM	SDCC	5B	203
Whiskering and Substrate Effects	THU	8:30 AM	SDCC	5B	225
Microstructure Evolutions	THU	2:00 PM	SDCC	5B	245

	Day	Time	Building	Room	Page
Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIII					
Interfacial Reactions of the Pb-free Solder Joints	MON	8:30 AM	SDCC	32B	93
Phase Equilibria and Transformations of the Pb-free Solders and Energy Materials	MON	2:00 PM	SDCC	32A	115
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	269
Microelectronics Reliability I	TUE	2:00 PM	SDCC	32A	160
General Issues in Microelectronics and Energy Materials	WED	2:00 PM	SDCC	32A	203
Microelectronics Reliability II	THU	2:00 PM	SDCC	32A	246
Phase Transformation and Microstructural Evolution					
Carbon Redistribution in Steels I	MON	8:30 AM	SDCC	31C	94
Fundamentals of Diffusion in Transformations in Steels	MON	2:00 PM	SDCC	31C	116
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	269
Carbon Redistribution in Steels II	TUE	8:30 AM	SDCC	31C	138
Multi-scale Modeling of Phase Transformations in Steels	TUE	2:00 PM	SDCC	31C	160
Alloying, Grain Refinement, and Microstructural Evolution in Steels	WED	8:30 AM	SDCC	31C	181
Processing and Microstructural Evolution I	WED	2:00 PM	SDCC	31C	204
Processing and Microstructural Evolution II	THU	8:30 AM	SDCC	31C	227
Martensitic Phase Transformations and Functional Materials	THU	8:30 AM	SDCC	13	226
Phase Transformations Induced by Irradiation I	THU	8:30 AM	SDCC	31B	226
Phase Transformations Induced by Irradiation II	THU	2:00 PM	SDCC	31B	246
Processing and Microstructural Evolution III	THU	2:00 PM	SDCC	31C	246
"Progress Towards Rational Materials Design in the Three Decades Since the Invention of the Embedded Atom Method: An MPMD Symposium in Honor of Dr. Michael I Baskes"					
Recent Advances in Interatomic Potentials	MON	8:30 AM	SDCC	30E	94
Interatomic Potentials and Applications	MON	2:00 PM	SDCC	30E	116
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	270
Advances in Atomistic Simulations - I	TUE	8:30 AM	SDCC	30E	139
Advances in Atomistic Simulations - II	TUE	2:00 PM	SDCC	30E	161
Advances in Atomistic Simulations - III	WED	8:30 AM	SDCC	30E	181
Radiation Effects in Oxide Ceramics and Novel LWR Fuels					
Experimental Characterization of Radiation Effects in Oxide Ceramics	WED	8:30 AM	SDCC	33B	182
Multi-scale Modeling of Radiation-induced Microstructure Evolution in Oxide Ceramics	WED	2:00 PM	SDCC	33B	204
Effects of Radiation on Thermal and Mechanical Properties of Ceramic Oxide Fuels	THU	8:30 AM	SDCC	33B	227
Novel Fuels, Pellet-cladding Interaction, and Modeling	THU	2:00 PM	SDCC	33B	247
Rare Metal Extraction & Processing Symposium					
Metalloids and Rare Extraction Process	MON	8:30 AM	SDCC	16B	95

	Day	Time	Building	Room	Page
Indium, Moly, and Tungsten Metallurgy	MON	2:00 PM	SDCC	16B	117
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	270
Calcium and Rare Earth Metallurgy	TUE	8:30 AM	SDCC	16B	139
Titanium, Lithium, Yttrium, and Zirconium	TUE	2:00 PM	SDCC	16B	161
Rhenium, Tin, Vanadium and SX Processing	WED	8:30 AM	SDCC	16B	182
Recycling and Sustainability Update					
Recycling	THU	8:30 AM	SDCC	16B	228
Waste	THU	2:00 PM	SDCC	16B	247
Shape Casting: 5th International Symposium					
Process Design and Innovation	WED	8:30 AM	SDCC	17B	183
Solidification and Microstructure I	WED	2:00 PM	SDCC	17B	205
Mechanical Properties	THU	8:30 AM	SDCC	17B	228
Solidification and Microstructure II	THU	2:00 PM	SDCC	17B	248
SMD 2014 Technical Division Student Poster Contest					
Poster Judging	MON	3:30 PM	SDCC	Sails Pavilion	270
SMD 2014 Technical Division Young Professional Poster Contest					
Posters	MON	6:30 PM	SDCC	Sails Pavilion	271
Solar Cell Silicon					
Silicon Production and Solidification	WED	2:00 PM	Marriott	Balboa	205
Silicon Refining I	THU	8:30 AM	Marriott	Balboa	229
Silicon Refining II	THU	2:00 PM	Marriott	Balboa	248
Solid-State Interfaces III: Toward an Atomistic-scale Understanding of Structure, Properties, and Behavior through Theory and Experiment					
Mechanical Properties	MON	8:30 AM	SDCC	6D	95
Interface Structures, Defects, and Shock Response	MON	2:00 PM	SDCC	6D	117
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	271
Oxides and Nanostructures I	TUE	2:00 PM	SDCC	4	161
Oxides and Nanostructures II	WED	8:30 AM	SDCC	4	183
Interface Morphology and Stability	WED	2:00 PM	SDCC	4	206
Grain Boundaries I	THU	8:30 AM	SDCC	4	229
Grain Boundaries II	THU	2:00 PM	SDCC	4	249
Solidification in Additive Manufacturing					
Session I: Material Behavior in AM Powder Bed Systems	THU	8:30 AM	SDCC	15B	230
Session II: Solidification in Complex and High Build Rate AM systems	THU	2:00 PM	SDCC	15B	249
Symposium on High Entropy Alloys II					
Alloy Development and Applications	WED	8:30 AM	SDCC	5A	184
Modeling and Mechanical Properties	WED	2:00 PM	SDCC	5A	206

	Day	Time	Building	Room	Page
Structures and Mechanical Properties	THU	8:30 AM	SDCC	5A	230
Other Properties	THU	2:00 PM	SDCC	5A	250
TMS2014 General Poster Session					
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	271
Ultrafine Grained Materials VIII					
Keynote Session	MON	8:30 AM	SDCC	6E	95
Special Session: Gradient and Layered Nanostructures	MON	2:00 PM	SDCC	6E	117
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	273
Young Scientist I: Deformation and Failure Mechanisms	TUE	8:30 AM	SDCC	6E	140
Young Scientist II: Microstructural Evolution	TUE	2:00 PM	SDCC	6E	162
Stability of Nanomaterials	WED	8:30 AM	SDCC	6F	185
Fundamental Deformation Phenomena	WED	8:30 AM	SDCC	6E	184
Powder Processing of Nanomaterials	WED	2:00 PM	SDCC	6E	207
High Pressure Torsion Studies	WED	2:00 PM	SDCC	6F	207
Equal Channel Angular Processing Studies	THU	8:30 AM	SDCC	6E	231
Roll Processing Studies	THU	8:30 AM	SDCC	6F	231
Alternative SPD and Surface Nanostructuring Methods	THU	2:00 PM	SDCC	6E	250
Applications of UFG Materials	THU	2:00 PM	SDCC	6F	251

2014 Aluminum Keynote Session — Innovation in the Alumina and Primary Aluminum Industries: How Will We Move on to the Next S-curve?

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Barry Sadler, Net Carbon Consulting Pty Ltd

Monday AM
February 17, 2014
Room: 6A
Location: San Diego Convention Center

Session Chair: Barry Sadler, Net Carbon Consulting Pty Ltd

8:30 AM Introductory Comments from Dr. Barry Sadler, Managing Director, Net Carbon Consulting Pty Ltd

8:35 AM Invited
Focus Areas and Possible Options for Aluminium Smelter Performance Enhancement: *Barry Welch*[1]; [1]Universities of NSW and Auckland and Welbank Consulting Ltd.

9:20 AM Invited
Further Innovation in the Bayer Process: Is This a Reality or a Pipe Dream?: *Gerald Roach*

10:05 AM Break

10:15 AM Invited
The Role of External Research Groups in Aluminium Industry Innovation: *Mark Taylor*[1]; [1]University of Auckland

10:50 AM Invited
Hydro's Innovation Engine - From Idea to Business: *Martin Segatz*[1]; [1]Hydro Aluminium Deutschland GmbH

11:15 AM Invited
Innovation in the North American Aluminum Industry: *Alton Tabereaux*

11:40 AM Invited
Innovation in Mining – Rio Tinto's "Mine of the Future"(TM)Programme: *Geoff Bearne*[1]; [1]Rio Tinto Technology and Innovation

12:10 PM Panel Discussion: Questions can be directed from the audience to a panel of the session presenters.

2014 Functional Nanomaterials: Synthesis, Properties and Applications — Nanomanufacturing I

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee
Program Organizers: Nitin Chopra, The University of Alabama; Terry Xu, The University of North Carolina at Charlotte; Jiyoung Kim, University of Texas at Dallas; Yuanbing Mao, University of Texas - Pan American; Ashwin Ramasubramaniam, University of Massachusetts Amherst; Jung-kun Lee, University of Pittsburgh; Ramki Kalyanaraman, The University of Tennessee, Knoxville; Stephen Turano, Georgia Tech Research Institute

Monday AM
February 17, 2014
Room: Ballroom D
Location: San Diego Marriott Marquis & Marina

Session Chairs: Terry Xu, The University of North Carolina at Charlotte; Jung-Kun Lee, Universit of Pittsburgh; Nitin Chopra, The Universty of Alabama

8:30 AM Keynote
Innovation in 2D and 3D Nano and Micro Manufacturing: *Henry Smith*[1]; [1]MIT

9:15 AM Invited
Sub-10-nm Patterning: Electron-beam Lithography and Templated Self-assembly: *Karl Berggren*[1]; [1]MIT

9:45 AM
A Patterned Memory Array of the Metal Oxide Nanostructure Fabricated by Scanning Probe Lithography and Its Functionalization with Bottom Electrodes: *Nuri Lee*[1]; William Jo[1]; C. Meny[2]; [1]Ewha Womans University; [2]UMR 7504 ULP-CNRS

10:05 AM Break

10:15 AM
A Scalable Aqueous Solution Synthetic Route to Nanophase TiO_2 Using a Continuous Stirred-tank Reactor: *Fuqiang Guo*[1]; Amrita Yasin[1]; George Demopoulos[1]; [1]McGill University

10:35 AM
Electrically-activated Tip Based Lithography for Writing Nanostructures by Electromigration-induced Liquid Flow: *Zhe Chen*[1]; Tarang Mungole[1]; Carolyn Stansell[2]; Indranath Dutta[1]; [1]Washington State University; [2]Boise State University

10:55 AM
Nano-laminated Ti3Al Porous Structure Produced by Hot Forging and Selective Dissolution: *Wei Daixiu*[1]; Koizumi Yuichiro[1]; Chiba Akihiko[1]; [1]Tohoku University

11:15 AM Invited
ALICE in Wonderland - A Story of Carbon Nanotube Electron Emission in Space: *Jud Ready*[1]; Mitchell Walker[1]; Graham Sanborn[1]; Lake Singh[1]; Stephen Turano[1]; Peter Collins[2]; [1]Georgia Institute of Technology; [2]Air Force Institute of Technology

2014 TMS RF Mehl Medal Symposium on Frontiers in Nanostructured Materials and Their Applications — Keynote Session on Nanomaterials, General Properties and Others

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Ramki Kalyanaraman, University of Tennessee; Haiyan Wang, Texas A&M University; Yuntian Zhu, North Carolina State University; Justin Schwartz, North Carolina State University; Amit Goyal, Oak Ridge National Laboratories

Monday AM
February 17, 2014
Room: Ballroom E
Location: San Diego Marriott Marquis & Marina

Session Chairs: Haiyan Wang, Texas A&M University; Ravindra Nuggehalli , NJIT

8:30 AM Keynote
Frontiers in Thin Film Epitaxy and Novel Nanostructured Materials: *Jagdish (Jay) Narayan*[1]; [1]North Carolina State University

9:10 AM Keynote
Probing Structure, Properties and Dynamics of Nanostructures through Scanning Transmission Electron Microscopy: *Stephen Pennycook*[1]; Wu Zhou[1]; Jaekwang Lee[1]; Juan-Carlos Idrobo[1]; Myron Kapetanakis[2]; Junhao Lin[2]; Sokrates Pantelides[2]; [1]Oak Ridge National Laboratory; [2]Vanderdbilt University

9:30 AM Keynote
Design and Applications of Nanostructured Energy Materials: *Sungho Jin*[1]; [1]UC San Diego

9:50 AM Keynote
Nanogenerators for Self-powered Systems and as Active Sensors: *Zhong Wang*[1]; [1]Georgia Institute of Technology

10:10 AM Break

10:30 AM Keynote
Magnetoelectric Control of Exchange Coupling in Monodomain BiFeO3 Heterostructures: *Chang-Beom Eom*[1]; [1]University of Wisconsin-Madison

10:50 AM Keynote
Stress-engineered Self-organized Nanostructure Array Assembly: A Rich Paradigm: *Anupam Madhukar*[1]; [1]University of Southern California

11:10 AM Keynote
Mechanical Behaviors of Heterogeneous Nanostructured Metals: *K. Lu*[1]; [1]Chinese Academy of Sciences

11:30 AM Keynote
The Principles of Grain Refinement during Severe Plastic Deformation: *Terence Langdon*[1]; [1]University of Southern California

11:50 AM Keynote
Influence of Length Scales on Precipitation Phenomena in Al Alloys: Tao Hu[1]; Julie Schoenung[1]; *Enrique Lavernia*[1]; [1]University of California, Davis

5th International Symposium on High Temperature Metallurgical Processing — High Efficiency New Metallurgical Technology

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Mark Schlesinger, Missouri University of Science and Technology; Onuralp Yücel, ITU; Rafael Padilla, University of Concepcion; Phillip Mackey, P.J. Mackey Technology; Guifeng Zhou, Wuhan Iron and Steel

Monday AM
February 17, 2014
Room: 18
Location: San Diego Convention Center

Session Chairs: Tao Jiang, Central South University; Joseph Lessard, Orchard Material Technology

8:30 AM Introductory Comments

8:35 AM Invited
Slag Structures and Properties by Spectroscopic Analysis: Effect of Water Vapor Relevant to a Novel Flash Ironmaking Technology: *M. Yousef Mohassab-Ahmed*[1]; Hong Yong Sohn[1]; [1]University of Utah

8:55 AM
An Innovative Electro-winning Process for Titanium Production: *Giuseppe Granata*[1]; Yoshinao Kobayashi[1]; Ryota Sumiuchi[1]; Akio Fuwa[1]; [1]Waseda University

9:10 AM Invited
A New Bottom Gas Purging System for Stationary and Tilting Copper Anode Furnaces: *Goran Vukovic*[1]; Klaus Gamweger[1]; [1]RHI AG

9:25 AM
Iron Removal from Titanium Ore Through Selective Chlorination and Its Reaction Analysis: *Jungshin Kang*[1]; Toru Okabe[1]; [1]The University of Tokyo

9:40 AM Invited
Lorentz Force Sigmometry: A Novel Technique for Measuring Thermo-physical Properties of Molten Metals: *Shatha Alkhalil*[1]; Thomas Fröhlich[1]; Yurii Kolesnikov[1]; André Thess[1]; [1]Ilmenau University of Technology

9:55 AM Break

10:05 AM
A Pilot-plant Scale Test of Coal-based Rotary Kiln Direct Reduction of Laterite Ore for Fe-Ni Production: *Guanghui Li*[1]; Junhao Liu; Mingjun Rao[1]; Jun Luo[1]; Changgen Wang[1]; Yuanbo Zhang[1]; [1]School of Minerals Processing and Bioengineering, Central South University

10:20 AM Invited
Preparation of Ferronickel Alloy Nugget through Reduction Roasting of Nickel Laterite Ore: Pan Chen[1]; *Xuewei Lv*[1]; Enguang Guo[1]; Qiugang Yuan[1]; Mei Liu[1]; [1]School of Materials Science and Engineering, Chongqing University, China

10:35 AM
Preparation of High Melting Point Alloys and Refractory Compounds with Its Own Chemical Energy: Dou Zhihe[1]; Shi Guanyong[1]; *Zhang Ting'an*[1]; Guan Yue[1]; Wen Ming[1]; Jiang Xiaoli[1]; Niu Liping[1]; [1]Northeastern University

10:50 AM
Reductive Sulfur-fixation Smelting of Stibnite Concentrate in Sodium Molten Salt: *Chen Yongming*[1]; Xue Haotian[1]; Yang Shenghai[1]; Tang Chaobo[1]; Tang Motang[1]; [1]School of Metallurgy and Environment,Central South University, P.R China

11:00 AM Invited
Research on the Solid-State Reduction Roasting of Phosphate Rock: Pan Chen[1]; Enguang Guo[1]; Qiugang Yuan[1]; Mei Liu[1]; *Xuewei Lv*[1]; [1]School of Materials Science and Engineering, Chongqing University, China

11:10 AM
Separation of Perovskite Phase from CaO-TiO_2-SiO_2-AL_2O_3-MgO System by Supergravity: Jintao Gao[1]; Jun-cheng Li[1]; *Zhan-cheng Guo*[1]; [1]University of Science and Technology Beijing

11:20 AM
New Process for Producing High Grade Iron Concentrate by Roasting Siderite Ore with Microwave Energy: Shaohua Ju[1]; Libo Zhang[1]; *Jinhui Peng*[1]; Shenghui Guo[1]; Xin Wang[1]; Yajian Wang[1]; [1]Yunnan Provincial Key Laboratory of Intensification Metallurgy

11:30 AM
Optimization of Flow Control Devices in a Twelve-strand Billet Continuous Casting Tundish with Two Strands Closed: *Jiangshan Zhang*[1]; Jingshe Li[1]; Shufeng Yang[1]; [1]University of Science and Technology Beijing

A Lifetime of Experience with Titanium Alloys: An SMD Symposium in Honor of Jim Williams, Mike Loretto and Rod Boyer — Williams Honorary Session I: Processing Science

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee
Program Organizers: Adam Pilchak, Air Force Research Laboratory; James Larsen, Air Force Research Laboratory; David Dye, Imperial College London; Jay Tiley, Air Force Research Laboratory

Monday AM
February 17, 2014
Room: 1A
Location: San Diego Convention Center

Session Chairs: John Allison, University of Michigan; Adam Pilchak, Air Force Research Laboratory

8:30 AM Invited
Crystal Plasticity Modeling and Validation of Extrusion Texture and Plasticity in a Near-alpha Titanium Alloy: *Xianfeng Ma*[1]; Adam Pilchak[2]; Patrick Martin[2]; Mei Li[3]; Dayong Li[4]; John Allison[1]; [1]University of Michigan; [2]Air Force Research Laboratory; [3]Ford Motor Company; [4]Shanghai Jiao Tong University

9:00 AM Invited
Some Challenges in the Physics of Thermomechanical Processing (TMP) of Alpha/Beta Titanium Alloys: *Lee Semiatin*[1]; Adam Pilchak[1]; [1]Air Force Research Laboratory

9:30 AM
Evolution of Microstructure and Transformation Texture Due to Variant Selection during Alpha Precipitation in Polycrystalline Alpha/Beta Titanium Alloys – A Simulation Study: *Rongpei Shi*[1]; Yunzhi Wang[1]; [1]The Ohio State University

9:50 AM
Variant Selection Due to Dislocations during α Precipitation in α/β Titanium Alloys: *Di Qiu*[1]; Rongpei Shi[2]; Weijie Lu[1]; Yunzhi Wang[2]; [1]Shanghai Jiao Tong University; [2]Ohio State University

10:10 AM Break

10:30 AM
Characterization and Modeling of EBAM processed Ti-6Al-4V: Thomas Ales[1]; Iman Ghamarian[1]; Graciela Penso[1]; Vikas Dixit[2]; Brian Welk[2]; *Peter Collins*[1]; [1]University of North Texas; [2]The Ohio State University

10:50 AM
Microstructural Analysis of Ti-6Al-4V Components Made by Electron Beam Additive Manufacturing: *Rashadd Coleman*[1]; Kevin Chou[1]; Viola Acoff[1]; [1]The University of Alabama

11:10 AM
Texture Development of $Ti_6A_{l4}V$ Components Fabricated by Electron Beam Melting: *Liming Zhou*[1]; Rashadd Coleman[1]; Viola Acoff[1]; [1]The University of Alabama

11:30 AM
Improving Surface Finish of Electron Beam Melting Parts by Laser Ablation: *Ashfaq Mohammad*[1]; Muneer Khan[1]; Abdulrahman AlAhmari[1]; [1]King Saud University

11:50 AM
A Novel Chemical Pathway for Producing Low Cost Ti by Direct Reduction of Ti Slag: *Scott Middlemas*[1]; Z. Zak Fang[1]; Jun Guo[1]; Peng Fan[1]; [1]University of Utah

Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Modeling — Ion Beam Irradiation

Sponsored by: TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee
Program Organizers: Peter Hosemann, University of California Berkeley; Julie Tucker, Knolls Atomic Power Laboratory; James Cole, Idaho National Laboratory; Todd Allen, University of Wisconsin-Madison

Monday AM
February 17, 2014
Room: 33B
Location: San Diego Convention Center

Session Chair: Peter Hosemann, University of California Berkeley

8:30 AM
Emulation of High Dose Reactor Irradiations of F-M Alloys Using Self-Ions: *Gary Was*[1]; Zhijie Jiao[1]; Elizabeth Beckett[1]; Anthony Monterrosa[1]; Janelle Wharry[2]; Stuart Maloy[3]; Osman Anderoglu[3]; Micah Hackett[4]; [1]University of Michigan; [2]Boise State University; [3]Los Alamos National Laboratory; [4]TerrraPower LLC

9:10 AM
Heavy Ion Irradiations of Fe-Cr Binary Alloys: Mychailo Toloczko[1]; *Alicia Certain*[1]; Frank Garner[2]; [1]Battelle/PNNL; [2]Radiation Effects Consulting

9:30 AM
Peculiarities of Ion Beam Irradiation Studies: *Igor Usov*[1]; [1]Los Alamos National Laboratory

9:50 AM
High-Dose Void Swelling in Ion-Irradiated Ferritic-Martensitic Steels: *Anthony Monterrosa*[1]; Elizabeth Beckett[1]; Zhijie Jiao[1]; Gary Was[1]; [1]University of Michigan

10:10 AM Break

10:30 AM
Impact of Beam Rastering on Void Swelling in Pure Iron: *Lin Shao*[1]; Jonathan Gigax[1]; Chao-chen Wei[1]; Abdulla Al Nuaimi[1]; Di Chen[1]; X. Wang[1]; F.A. Garner[2]; [1]Texas A&M University; [2]Radiation Effects Consulting

10:50 AM
What Have We Learned from Ion Bombardment Studies to Allow Development of Improved Swelling-resistant Ferritic-martensitic and ODS Alloys for Service to Very High Neutron Fluence?: *Frank Garner*[1]; Mychailo Toloczko[2]; V. Voyevodin[3]; V. Bryk[3]; O. Borodin[3]; A. Kalchenko[3]; V. Melnichenko[3]; I. Neklyudov[3]; Lin Shao[4]; [1]Radiation Effects Consulting; [2]Pacific Northwest National Laboratory; [3]Kharkov Institute of Physics and Technology; [4]Texas A&M University

11:10 AM
Implantation and Characterization of Helium in Nuclear Materials at Jannus-Saclay (France): *Lucile Beck*[1]; Patrick Trocellier[1]; Shradha Agarwal[1]; Yves Serruys[1]; Sylvain Vaubaillon[1]; [1]CEA

11:30 AM
The Effect of External Stress on Ion Irradiation-induced c-Loop Formation in Zry-4: *Rosmarie Hengstler-Eger*[1]; Petra Britt Hoffmann[1]; Marquis Kirk[2]; Winfried Petry[3]; [1]AREVA GmbH; [2]Argonne National Laboratory; [3]Technische Universität München and Research Neutron Source Heinz Maier-Leibnitz (FRM 2)

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms — Characterization of Strain

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Materials Characterization Committee, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: John Carpenter, Los Alamos National Laboratory; Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Khalid Hattar, Sandia National Laboratories; Marko Knezevic, University of New Hampshire; Irene Beyerlein, Los Alamos National Laboratory

Monday AM
February 17, 2014
Room: 8
Location: San Diego Convention Center

Session Chair: Rodney McCabe, Los Alamos National Laboratory

8:30 AM Invited
Analysis of Plastic Deformation by EBSD Techniques: *David Field*[1]; [1]Washington State University

9:00 AM
In Situ X-ray Diffraction of Biaxially Deformed Automotive Steels: *David Collins*[1]; Richard Todd[1]; Angus Wilkinson[1]; [1]University of Oxford

9:20 AM
Grain Rotation and Development of Orientation Spread in a Deforming Polycrystal: *Thomas Buchheit*[1]; Jay Carroll[1]; Hojun Lim[1]; Blythe Clark[1]; Corbett Battaile[1]; Brad Boyce[1]; [1]Sandia National Laboratories

9:40 AM Invited
Analysis of Localized Strain Dependencies during Microstructural Evolution by Correlated Precession Diffraction and In Situ TEM: *Mitra Taheri*[1]; [1]Drexel University

10:10 AM Break

10:30 AM Invited
Quantifying Stress and Dislocation Density Distributions at the Microstructural Scale using High Resolution Electron Backscatter Diffraction: *Angus Wilkinson*[1]; Jun Jiang[1]; T Britton[2]; [1]University of Oxford; [2]Imperial College London

11:00 AM
EBSD Cross Correlation Method to Analyze Slip Bands/Grain Boundary Interactions in a Polycristalline γ' Strengthened Ni-based Superalloy: *Patrick Villechaise*[1]; Jonathan CORMIER[1]; Baptiste Larrouy[1]; [1]Pprime Institut ENSMA -CNRS

11:20 AM
Deformation and Damage Behavior in Alloy 617 with Different Strain Rates and Long Term Ageing: *Guocai Chai*[1]; Mattias Calmunger[1]; Sten Johansson[1]; Johan Moverare[1]; [1]Linköping University

11:40 AM
Characterization of Near-surface Microstructure of Surface-treated IN718 Superalloy by X-ray Diffraction and TEM: Amrinder Gill[1]; Abhishek Telang[1]; Tamas Ungar[2]; Gunther Eggeler[3]; Hitoshi Soyama[4]; Young-Sik Pyun[5]; Seetha Mannava[1]; Dong Qian[6]; *Vijay Vasudevan*[1]; [1]University of Cincinnati; [2]Lorand Eotvos University; [3]Ruhr University Bochum; [4]Tohoku University; [5]Sun Moon University; [6]University of Texas at Dallas

Advanced Composites for Aerospace, Marine, and Land Applications — Processing and Design of Composites

Sponsored by: TMS Structural Materials Division, TMS/ASM: Composite Materials Committee
Program Organizers: Tomoko Sano, US Army Research Laboratory; Michael Peretti, GE Aviation; Tirumalai Srivatsan, The University of Akron

Monday AM
February 17, 2014
Room: 6F
Location: San Diego Convention Center

Session Chairs: Liang Dong, University of Virginia; Mike Peretti, GE Aviation

8:30 AM Invited
Ultra-strong Light Weight Cellular Lattice Structures: *Liang Dong*[1]; Haydn Wadley[1]; [1]University of Virginia

9:10 AM
Deformation Behavior of Aluminum Alloy AA6061– 10% Fly Ash Composite for Aerospace Application: Ajit Bhandakkar[1]; R C Prasad[1]; *Shankar ML Sastry*[2]; [1]IIT, Bombay; [2]WUSTL

9:30 AM
Compressive Property of Aluminum Foams Fabricated Under Low Pressure: *Zhuokun Cao*[1]; Guangchun Yao[1]; [1]Northeastern University, China

9:50 AM Break

10:10 AM
Effect of the Composition of B4C -Al Composites on Their Mechanical Properties and Resistance to Corrosion: *Lucio Vazquez*[1]; Alejandro Altamirano[2]; Edgardo Hernandez[2]; Víctor Cortés[2]; Elizabeth Garfias[2]; Elizabeth Refugio[2]; Manuel Vite[1]; [1]IPN; [2]Universidad Autonoma Metropolitana

10:30 AM
Bacterial Cellulose Enhances Beta Phase in PVDF: *Vivek Verma*[1]; Sampada Bodkhe[2]; Rajesh PSM[1]; Sudhir Kamle[1]; [1]IIT Kanpur; [2]GE Aviation

10:50 AM
Geopolymer from Industrial Wastes: A Construction Material for 22nd Century: *Pradeep Rana*[1]; Radha Dash[1]; Ratan Ganguly[1]; [1]GIET

11:10 AM Invited
Synthesis TaC-TaB2 Composite Nano Powders: *Behzad Mehdikhani*[1]; Gholam Borhani[1]; [1]Malek-e-ashtar University of Technology

Advanced Materials for Power Electronics, Power Conditioning, and Power Conversion II — Advanced Materials for Power Electronics, Power Conversion, and Power Conditioning

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee, TMS: Magnetic Materials Committee
Program Organizers: Paul Ohodnicki, National Energy Technology Laboratory; Michael McHenry, Carnegie Mellon University; Matthew Willard, Case Western Reserve University; Rachael Myers-Ward, NRL; Mike Lanagan, Penn State University; Clive Randall, Penn State University

Monday AM
February 17, 2014
Room: Cardiff
Location: San Diego Marriott Marquis & Marina

Session Chair: Paul Ohodnicki, National Energy Technology Laboratory

8:30 AM Introductory Comments

8:35 AM Invited
GE SiC Power Device Development for High Performance Power Conversion Applications: *Peter Losee*[1]; [1]GE Global Research

9:05 AM Invited
Dielectrics for Advanced Power Electronics: *Koichi Banno*[1]; Shoichiro Suzuki[1]; Toshikazu Takeda[1]; Akira Ando[1]; [1]Murata Manufacturing Co., Ltd.

9:35 AM Invited
CeraLink™: A New Capacitor Technology for Power Electronics Based on Anti-ferroelectric Ceramics and Copper Electrodes: *Christoph Auer*[1]; Michael Schossmann[1]; Markus Koini[1]; Juergen Konrad[1]; Markus Puff[1]; [1]EPCOS OHG

10:05 AM Break

10:25 AM Invited
The Status of Commercially Viable GaN Based Power Devices: *Michael Briere*[1]; [1]ACOO Enterprises LLC

10:55 AM Invited
Nanocrystalline Magnetic Components for Megawatt Scale High Frequency Power Electronics: *William Reass*[1]; Jeffery Audia[1]; Alex Scheinker[1]; [1]Los Alamos National Laboratory

11:25 AM Invited
A New Insight into Nanocrysallization of Amorphous Fe-based Alloys: *Motoki Ohta*[1]; Naoki Ito[1]; Yoshihito Yoshizawa[2]; Ryusuke Hasegawa[1]; [1]Metglas(R) Inc.; [2]Hitachi Metals, Ltd.

Advances in Surface Engineering: Alloyed and Composite Coatings III — Mechanical, Wear, and Corrosion Properties of Coatings

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee
Program Organizers: Sandip Harimkar, Oklahoma State University; Jeff De Hosson, Univ of Groningen; Roger Narayan, University of North Carolina and North Carolina State University; Efstathios (Stathis) Meletis, University of Texas at Arlington; Virendra Singh, Schlumberger Rosharon Campus; Srinivasa Bakshi, Indian Institute of Technology-Madras; Mathieu Brochu, McGill University; Arvind Agarwal, Florida International University; Jian Luo, UC San Diego; Nancy Michael, University of Texas at Arlington; Nuggehalli Ravindra, New Jersey Institute of Technology; Adele Carradò, IPCMS; Choong-un Kim, University of Texas at Arlington; Amit Pandey, Rolls Royce LG Fuel Cell

Monday AM
February 17, 2014
Room: 1B
Location: San Diego Convention Center

Session Chairs: Sandip Harimkar, Oklahoma State University; Patrick Masset, Fraunhofer UMSICHT

8:30 AM Invited
Flexible Diamond-like Carbon Films on Viscoelastic Substrates: An Overview: *Jeff De Hosson*[1]; Y Pei[1]; Diego Martinez-Martinez[1]; [1]Univ of Groningen

8:50 AM Invited
Characterization of Nanostructured Al-Si Claddings on Al-7075 Substrate Using Nano-impact Indentation Technique: Abhi Ghosh[1]; Javier Arreguin[1]; Jason Milligan[1]; *Mathieu Brochu*[1]; [1]McGill University

9:10 AM Invited
Improved Mechanical Properties of Cermet Coatings as a Function of Grain Size: *Chris Melnyk*[1]; Robert Gansert[2]; Brian Weinstein[1]; David Grant[1]; [1]California Nanotechnologies, Inc.; [2]Advanced Materials & Technology Services, Inc.

9:30 AM
Sub-surface Mechanical Properties Evaluation of Oilfield Alloys Treated by Surface Ultrasonic Peening: *Virendra Singh*[1]; Manuel Marya[1]; [1]Schlumberger

9:45 AM
Wear Resistance of Anodic TiO_2 Coating Produced on Ti-6Al-4V Alloys: Maria Vera[1]; Mario Rosenberger[1]; *Carlos Schvezov*[1]; Alicia Ares[1]; [1]CONICET-UNaM

10:00 AM
Understanding Compatibilities between Advanced Coatings and Lubricants via Tribo-film Characterization: *Jun Qu*[1]; Zhen-bing Cai[2]; Harry Meyer[1]; Cheng Ma[1]; Miaofang Chi[1]; Huimin Luo[1]; [1]Oak Ridge National Laboratory; [2]Southwest Jiaotong University

10:15 AM Break

10:25 AM
Conditioning of Composite Lubricant Powder for Cold Spray: *Maryam Neshastehriz*[1]; Ivi Smid[1]; Al Segall[1]; Tim Eden[1]; [1]Penn State

10:40 AM
Wear and Corrosion Performance of Modified Ni-based WC Metal Matrix Composite Overlays for Use in Severe Wear Applications: *Tonya Wolfe*[1]; Hani Henein[2]; Gary Fisher[1]; [1]Alberta Innovates - Technology Futures; [2]University of Alberta

10:55 AM
Wear Resistance of Iron Aluminide/Titanium Carbide Composite Coatings Prepared by In-Situ Precipitation: *Mahdi Amiriyan*[1]; Houshang Alamdari[1]; Carl Blais[1]; Robert Schulz[2]; [1]Université Laval; [2]Hydro-Quebec Research Institute (IREQ)

11:10 AM
Corrosion Resistance of Metals in Molten Zn Alloys: *Jong Min Byun*[1]; Seok Hyun Hwang[1]; Tae Yeob Kim[2]; Woo Sung Jung[2]; Young Do Kim[1]; [1]Hanyang University; [2]POSCO

11:25 AM
Ni- Al_2O_3 Based Thermal Spray Coatings for Protection Against Erosion: *Harpreet Grewal*[1]; Harpreet Arora[2]; Harpreet Singh[1]; Anupam Agrawal[1]; Sundeep Mukherjee[2]; [1]Indian Institute of Technology; [2]University of North Texas

11:40 AM
Experimental Investigation of Silt Erosion Resistance of SiC Nanoparticle Reinforced Polyurethane Coating on 16Cr-5Ni Martensitic Steel: *C. Syamsundar*[1]; Dhiman Chatterjee[1]; M. Kamaraj[1]; A. K. Maiti[2]; [1]Indian Institute of Technology, Madras; [2]BHEL (R&D), Hyderabad

11:55 AM
Wear Resistant Cu-Ag Alloys Obtained by Sliding-induced Chemical Nanolayering Reaction: *Fuzeng Ren*[1]; Pascal Bellon[1]; Robert Averback[1]; [1]University of Illinois at Urbana-Champaign

Algorithm Development in Computational Materials Science and Engineering — Algorithms for Lower Length Scale Modeling: Ab Initio, Atomistics and Materials Chemistry: Part I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee
Program Organizers: Jonathan Zimmerman, Sandia National Laboratories; Douglas Spearot, University of Arkansas; Adrian Sabau, Oak Ridge National Laboratory; Mark Tschopp, Army Research Laboratory; Mohsen Asle Zaeem, Missouri University of Science and Technology

Monday AM — Room: 31B
February 17, 2014 — Location: San Diego Convention Center

Session Chairs: Jonathan Zimmerman, Sandia National Laboratories; Douglas Spearot, University of Arkansas

8:30 AM Invited
A Computational Algorithm to Produce Virtual X-ray and Electron Diffraction Patterns of Interfaces from Atomistic Simulations: Shawn Coleman[1]; Mehrdad Mirzaei Sichani[1]; *Douglas Spearot*[1]; [1]University of Arkansas

9:10 AM
Microstructural Characterization of Shape Memory Alloys on the Atomic Scale: *Christoph Begau*[1]; Alexander Hartmaier[1]; [1]Ruhr-Universität Bochum

9:30 AM
Tracking Microstructure Evolution in Crystalline Materials: A Post-processing Algorithm for Atomistic Simulations: *Jason Panzarino*[1]; Seyed Saeidi[1]; Timothy Rupert[1]; [1]University of California Irvine

9:50 AM
Stick Slip Response of Dislocation Core: *Mishreyee Bhattacharya*[1]; Amlan Dutta[2]; Parthasarathi Barat[1]; [1]Variable Energy Cyclotron Centre; [2]S.N. Bose National Centre for Basic Sciences

10:10 AM Break

10:30 AM
A Fractal Dimension Based Approach to Decipher Grain Boundary Chemomechanics at Quantum Scale: You Sung Han[1]; *Vikas Tomar*[1]; [1]Purdue University

10:50 AM
Ab Initio Determination of Interfacial Energetics of Alloys: *Liang Qi*[1]; Maarten de Jong[1]; Mark Asta[1]; [1]University of California,Berkeley

11:10 AM
Linear Scaling DFT for Defects in Metals: *Mauricio Ponga*[1]; Michael Ortiz[1]; Kaushik Bhattacharya[1]; [1]California Institute of Technology

11:30 AM
Smart Use of Density Functional Theory Calculations to Drive Newtonian Dynamics: *Reese Jones*[1]; Michael Shaughnessy[1]; [1]Sandia National Laboratories

Biological Materials Science Symposium — Mechanical Behavior of Biological Materials I: Bone and Teeth (In Honor of Professor Robert O. Ritchie, the 2014 Acta Materialia Gold Medal Award Winner)

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Po-Yu Chen, National Tsing Hua University; Rajendra Kasinath, Johnson and Johnson Company; Dwayne Arola, University of Washington; Kalpana Katti, North Dakota State University

Monday AM — Room: 33A
February 17, 2014 — Location: San Diego Convention Center

Session Chairs: Po-Yu Chen, National Tsing Hua University; Wen Yang, ETH Zurich; Dwayne Arola, University of Maryland Baltimore County

8:30 AM Introductory Comments

8:35 AM Invited
Creep Deformation of Trabecular Bone: *Joanna McKittrick*[1]; Ekaterina Novitskaya[1]; Robert Sah[1]; Darryl D'Lima[2]; Peter Chen[1]; [1]University of California, San Diego; [2]Scripps Translational Science Institute

9:05 AM
Micromechanical Characterization of Selected Hierarchical Components of Bovine Cortical Bone: *Kelly Kranjc*[1]; Katharine Flores[1]; [1]Washington University

9:25 AM
Bird Bones in Bending and Torsion: *Ekaterina Novitskaya*[1]; Melisa Ribero Vairo[2]; Carolyn Zin[1]; Marc Meyers[1]; Joanna McKittrick[1]; [1]UC San Diego; [2]Universidad Nacional de Cuyo, Centro Universitario

9:45 AM
Doctor Blading Artificial Nacre and Bone: Sacha Cavelier[1]; Xuan Hu[1]; *Francois Barthelat*[1]; Mohammad Seyed Mirkhalaf[1]; [1]McGill University

10:05 AM Break

10:20 AM Keynote
Multi-scale Study of Deformation and Fracture in Diseased Bone: *Robert Ritchie*[1]; Elizabeth Zimmermann[2]; Hrishikesh Bale[1]; Bernd Gludovatz[3]; Holly Barth[4]; Claire Acevedo[3]; Alessandra Carriero[5]; Björn Busse[2]; [1]University of California Berkeley; [2]University Medical Center Hamburg-Eppendorf; [3]Lawrence Berkeley National Laboratory; [4]Lawrence Livermore National Laboratory; [5]Imperial College London

11:00 AM
Molecular and Ultrastructural Changes in Human Bone with Osteogenesis Imperfecta: *Kalpana Katti*[1]; Chunju Gu[1]; Scott Payne[1]; Dinesh Katti[1]; [1]North Dakota State University

11:20 AM
Effect of Aging on the Microstructure, Hardness and Chemical Composition of Human Dentin: *Carolina Montoya Mesa*[1]; Edgar Ossa Henao[1]; Dwayne Arola[2]; [1]Eafit University; [2]University of Maryland Baltimore County

11:40 AM
The Importance of Proteins on the Crack Growth Resistance of Enamel: *Mobin Yahyazadehfar*[1]; Dwayne Arola[1]; [1]University of Maryland Baltimore County

Bulk Metallic Glasses XI — Alloy Development and Applications I

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; H. Choo, University of Tennessee; Y. Gao, University of Tennessee; Y. F. Shi, Rensselaer Polytechnic Institute

Monday AM
February 17, 2014
Room: 2
Location: San Diego Convention Center

Session Chairs: Peter Liaw, University of Tennessee; William Johnson, California Institute of Technology

8:30 AM Keynote
Composition Variation of Glass Formation in Novel Multicomponent Ni-based Bulk metallic Glasses: *William Johnson*[1]; Jong Ha[1]; Marios Demetriou[1]; [1]California Institute of Technology

9:00 AM
Formation of In Situ and Ex Situ Composites in Zr-based Bulk Metallic Glass: *Gerhard Castro*[1]; Atakan Peker[1]; [1]Applied Sciences Laboratory/ Institute for Shock Physics/ Washington State University

9:10 AM Invited
New Atomization Technology for Fine Amorphous Alloy Powder Production: *Y. Yokoyama*[1]; Torao Yamagata[2]; Hiroshi Izaki[2]; Takuichi Yamagata[2]; Yusuke Suenaga[3]; [1]Institute for Materials Research; [2]Hard Industry; [3]Iwate University

9:30 AM
Development of Ex-situ Bulk Metallic Glass Composites through Tailoring Transformation Character of NiTi-X Secondary Phases: *Hyunseok Oh*[1]; Jinkyu Lee[2]; Yeonwook Kim[3]; Wancheok Woo[4]; Eunsoo Park[1]; [1]Seoul National University; [2]Kongju National University; [3]Keimyung University; [4]Korea Atomic Energy Research Institute

9:40 AM Invited
Processing of Bulk Metallic Glasses for Enabling Applications: *Atakan Peker*[1]; [1]Washington State University

10:00 AM Break

10:20 AM Invited
Identifying Bulk Metallic Glass Compositions Through Combinatorial Strategies: Yanhhui Liu[1]; Yanglin Li[1]; Sungwoo Sohn[1]; *Jan Schroers*[1]; [1]Yale University

10:40 AM Invited
BMG Nanoglass Synthesized by Mechanical and Chemically Driven Methods: *Hans Fecht*[1]; [1]Ulm University

11:00 AM
An Efficient Method to Identify Glass Forming Alloys: *Peter Tsai*[1]; Katharine Flores[1]; [1]Washington University in St. Louis

11:10 AM Invited
Exploiting Surface Chemistry to Develop Wear-resistant Bulk Metallic Glass Gears for Aerospace and Planetary Gearboxes: *Douglas Hofmann*[1]; Joanna Kolodziejska[1]; Scott Roberts[1]; Laura Andersen[2]; Kenneth Vecchio[2]; William Johnson[3]; Andrew Kennett[1]; [1]NASA JPL/Caltech; [2]UC San Diego; [3]Caltech

11:30 AM
Novel Strategies for Improving the Glass-forming Ability and Mechanical Properties of Zr-based Bulk Metallic Glasses: *Davide Granata*[1]; Erwin Fischer[1]; Jörg F. Löffler[1]; [1]ETH Zürich, Laboratory of Metal Physics and Technology

11:40 AM Invited
Development of Superelastic Bulk Metallic Glass Composites: Wook Ha Ryu[1]; Hye Jung Chang[2]; Wan Chuck Woo[3]; *Eun Soo Park*[1]; [1]Seoul National University; [2]Korea Institute of Science and Technology ; [3]Korea Atomic Energy Research Institute

12:00 PM Invited
Deformations in Nano-sized Pillars of Metallic Glasses: *Jeff De Hosson*[1]; [1]Univ of Groningen

Celebrating the Megascale: An EPD Symposium in Honor of David G.C.Robertson — Keynote Session

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee
Program Organizers: Phillip Mackey, P.J. Mackey Technology; Rodney Jones, Mintek; Eric Grimsey, Curtin University, W A School of Mines; Geoffrey Brooks, Swinburne University of Technology

Monday AM
February 17, 2014
Room: 16A
Location: San Diego Convention Center

Session Chairs: Phillip Mackey, P.J. Mackey Technology; Eric Grimsey, Curtin University, W A School of Mines

8:30 AM Introductory Comments

8:35 AM Invited
David Gordon Campbell Robertson: A Biographical Sketch: *John See*[1]; [1]Consultant

8:55 AM Invited
Evolution of the Large Copper Smelter – 1800s to 2013: *Phillip Mackey*[1]; [1]P.J. Mackey Technology Inc.

9:20 AM Invited
Evolution of the Mega-scale in Ferro-alloy Electric Furnace Smelting: *Lloyd Nelson*[1]; [1]Anglo American Platinum Ltd

9:45 AM Invited
From Sulfide Flash Smelting to a Novel Flash Ironmaking Technology: *Hong Yong Sohn*[1]; [1]University of Utah

10:10 AM Break

10:25 AM Invited
Fostering Minerals Workforce Skills of Tomorrow through Education and Training Partnerships: *Gavin Lind*[1]; [1]Minerals Council of Australia

10:50 AM Invited
Modeling of Ladle Metallurgy in Steelmaking: *Gordon Irons*[1]; Krishnakumar Krishnapisharody[2]; Kevin Graham[3]; [1]McMaster University; [2]Saarstahl; [3]Vale

11:15 AM Invited
Process Metallurgy an Enabler of Resource Efficiency – Linking Product Design to Metallurgy: *Markus Reuter*[1]; [1]Outotec Oyj

11:40 AM Invited
Horizontal Single Belt Casting (HSBC) of Ca-based, Bulk Metallic Glass (BMG) Strips: *Roderick Guthrie*[1]; Mihaiela Isac[1]; Donghui Li[1]; Luis Calzado[1]; [1]McGill University

Characterization of Minerals, Metals and Materials 2014 — Characterization of Ceramics and Clays

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee
Program Organizers: John Carpenter, Los Alamos National Laboratory; Chen-Guang Bai, Chongqing University; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Monteiro, State University of North Rio de Janeiro; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal Global R&D

Monday AM
February 17, 2014
Room: 7A
Location: San Diego Convention Center

Session Chairs: Benjamin Iverson, Halliburton; Takashi Nagai, Chiba Institute of Technology

8:30 AM
FTIR and Raman Spectroscopic Investigation on the Structure of CaO-SiO2-TiO2 Ternary Slags: *Long Wang*[1]; Liangying Wen[1]; Jiajia Tu[1]; Shengfu Zhang[1]; Chenguang Bai[1]; [1]Chongqing University

8:50 AM
Characterization of Heavy Clay Ceramic Mixed with Red Mud Waste: *Carlos Maurício Vieira*[1]; Michelle Babisk[1]; Sergio Monteiro[1]; [1]State University of the North Fluminense

9:10 AM
High Temperature Exposure of Oil Well Cements: *Benjamin Iverson*[1]; [1]Halliburton

9:30 AM
Determination of Temperature and Time Calcination of Clays for Production of Metakaolin based on Pozzolanic Activity: *Jonas Alexandre*[1]; Afonso Azevedo[1]; Gustavo Xavier[1]; Sergio Monteiro[2]; Carlos Mauricio Vieira[1]; [1]UENF; [2]IME

9:50 AM Break

10:00 AM
Platinum Group Metal Oxide Absorption Properties of Perovskite-type Oxide: *Takashi Nagai*[1]; Kazuma Nagumo[1]; Hiroyuki Ishii[1]; Takuya Wada[1]; [1]Chiba Institute of Technology

10:20 AM
PBT/Brazilian Clay Nanocomposites Prepared by Melt Intercalation: Effects of Organophilic Clay Content and Ionizing Radiation Treatment: Mariana Sartori[1]; Maiara Ferreira[1]; Franciso Díaz[2]; Vijaya Rangari[3]; Shaik Jeelani[3]; *Esperidiana Moura*[1]; [1]Nuclear and Energy Research Institute, IPEN-CNEN/SP; [2]Metallurgical and Materials Engineering Department, Polytechnic School, University of São Paulo; [3]Tuskegee University

10:40 AM
Modification Research of Si_3N_4-SiC Heat Absorption Ceramic Material Used for Tower Type Solar Thermal Power Plant: *Meng Liu*[1]; Xiaohong Xu[2]; Jianfeng Wu[2]; Guotao Xu[1]; Gaifeng Xue[1]; Jixiong Liu[1]; [1]Research and Development center of Wuhan Iron and Steel (group) Corporation; [2]Wuhan University of Technology

11:00 AM
Microstructural and Electrical Properties of 0.5 mol% Al_2O_3–0.1 mol% B_2O_3–Doped ZnO Ceramics: Berat Yüksel[1]; *Gökhan Hardal*[1]; [1]Istanbul University

11:20 AM
Redox Behavior of Macroporous CeO_2 –ZrO_2 Solid Solutions: *Hua Wang*[1]; [1]Kunming University of Science and Technology

Computational Modeling and Simulation of Advanced Materials for Energy Applications — Starting from Quantum Mechanics

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee
Program Organizers: Lan Li, Boise State University; Laura Bartolo, Kent State University; Cong Wang, Northwestern University; Chandler Becker, NIST

Monday AM
February 17, 2014
Room: Mission Hills
Location: San Diego Marriott Marquis & Marina

Session Chair: Lan Li, Boise State University

8:30 AM Introductory Comments

8:40 AM Invited
Ab Initio Simulations of Li-ion Battery Materials: From Modeling of Cationic Ordering and Phase Behavior of the High-voltage Spinel to Large-scale investigations for Novel Electrode Materials and the Materials Project: *Kristin Persson*[1]; [1]LBNL

9:10 AM Invited
Computational Approaches to Critical Challenges of Li-air and Li-ion Batteries: Electrolyte Transport and Reactant Spectroscopy: *Boris Kozinsky*[1]; [1]Bosch Research

9:40 AM
Density Functional Theory Study on Nitrogen-derived Non-precious Transition Metal Carbon Nanomaterials as Fuel Cell Electrocatalysts: *Guofeng Wang*[1]; Shyam Kattel[1]; Kexi Liu[1]; [1]Univeristy of Pittsburgh

10:00 AM Break

10:20 AM Invited
Theoretical Studies of Hydrogen Effects on Lithium-based Ceramics for Tritium-breeding Application in Fusion Reactor: *Tao Tang*[1]; Ruizhi Qiu[2]; Jiangli Cao[3]; Yu Wang[4]; [1]China Academy of Engineering Physics; [2]Science and Technology on Surface Physics and Chemistry Laboratoy; [3]Institute for Advanced Materials and Technology, University of Science and Technology Beijing; [4]Department of Applied Physics, The Hong Kong Polytechnic University

10:50 AM
Theoretical Study on the Interactions of Impurity Boron on Si(110) Surface with H+, OH– and O_2: Jianwen Tang[1]; Zili Liu[2]; *keqiang Xie*[1]; Xiumin Chen[1]; Wenhui Ma[1]; Bin Yang[1]; [1]Kunming University of Science and Technology; [2]Kunming Metallurgy College

11:10 AM
Reaction Pathways and Activation Energies of
Precious Metal-free Electrocatalyst for Oxygen Reduction Reaction: *Shwetank Yadav*[1]; Chandra Veer Singh[1]; [1]University of Toronto

Computational Thermodynamics and Kinetics — In Honor of Dr. Mark Asta, EMPMD Outstanding Scientist: Session I

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Long Qing Chen, Penn State University; Guang Sheng, Scientific Forming Technologies Corporation; Jeffrey Hoyt, McMaster University; Dallas Trinkle, University of Illinois at Urbana-Champaign

Monday AM
February 17, 2014
Room: 30D
Location: San Diego Convention Center

Session Chairs: Jeff Hoyt, Mcmaster University; Vidvuds Ozolins, University of California, Los Angeles

8:30 AM Introductory Comments

8:35 AM Invited
Atomistic Simulation Studies of Materials Interfaces: Recent Insights and Remaining Challenges: *Mark Asta*[1]; [1]University of California, Berkeley

9:10 AM Invited
Compressive Sensing as a Robust and Easy-to-use Tool for Doing Alloy Theory: Weston Nielson[1]; Fei Zhou[2]; Yi Xia[1]; Lance Nelson[3]; Gus Hart[3]; *Vidvuds Ozolins*[1]; [1]University of California, Los Angeles; [2]Lawrence Livermore National Laboratory; [3]Brigham Young University

9:40 AM Invited
First-principles Investigation of Mg-Rare Earth Precipitates and LPSO Structures: Ahmed Issa[1]; James Saal[1]; *Chris Wolverton*[1]; [1]Northwestern University

10:10 AM Break

10:30 AM Invited
Accelerated Molecular Dynamics Simulation via "SISYPHUS": *Axel van de Walle*[1]; [1]Brown University

11:00 AM Invited
Interface Thermodynamics and Phase Transformations in Solid-solid Interfaces: T. Frolov[1]; *Y. Mishin*[2]; [1]University of California, Berkeley; [2]George Mason University

11:30 AM Invited
Superionic Conductor Lithium Conduction: *Gerbrand Ceder*[1]; Yifei Mo[1]; Shyue Ping Ong[1]; William Davidson Richards[1]; [1]Massachusetts Institute of Technology

Data Analytics for Materials Science and Manufacturing — The Business of Data Analytics

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Jeff Simmons, Air Force Research Laboratory; Charles Bouman, Purdue University; Fariba Fahroo, Air Force Office of Scientific Research; Surya Kalidindi, Georgia Institute of Technology; Jeremy Knopp, Air Force Research Laboratory; Peter Voorhees, Northwestern University

Monday AM
February 17, 2014
Room: 15B
Location: San Diego Convention Center

Session Chairs: David Furrer, Pratt & Whitney; Russell Irving, GE Global Research

8:30 AM Invited
The MGI and the Role of Theory: *James Warren*[1]; [1]NIST

9:00 AM Invited
Analyzing and Mining Materials Data: From Academia to Industry: *Bryce Meredig*[1]; C. Wolverton[2]; [1]Citrine Informatics; [2]Northwestern University

9:30 AM Invited
Foundational Engineering Problem: Uncertainty Quantification in Multi-disciplinary Analysis of Bulk Residual Stresses in Disks: *Lauren Gray*[1]; Grant Reinman[1]; Vasisht Venkatesh[1]; Vikas Saraf[2]; Christopher Szczepanski[3]; Michael Caton[3]; [1]Pratt & Whitney; [2]ATI Ladish Forging; [3]Air Force Research Laboratory

10:00 AM Break

10:30 AM Invited
An ICME Example in Production: ICME-net: *Russell Irving*[1]; [1]GE

11:00 AM Invited
Rapid Ideation, Modeling and Simulation in a Collaborative Crowdsourcing Environment for Evolutionary Design (CEED): *Joseph Salvo*[1]; Rusty Irving[1]; [1]GE

11:30 AM Invited
Phase-based Property Data Informatics: *Carelyn Campbell*[1]; Ursula Kattner[1]; Alden Dima[1]; [1]National Institute of Standards and Technology

Dynamic Behavior of Materials VI – An SMD Symposium in Honor of Professor Marc Meyers — Shock-Compression of Materials

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Naresh Thadhani, Georgia Institute of Technology; George Gray, Los Alamos National Laboratory

Monday AM
February 17, 2014
Room: 3
Location: San Diego Convention Center

Session Chairs: Naresh Thadhani, Georgia Institute of Technology; George Gray, Los Alamos National Laboratory

8:30 AM Introductory Comments

8:35 AM Keynote
On the Shocking Behavior of Professor Marc Meyers: *L. Murr*[1]; [1]University of Texas at El Paso

9:05 AM Invited
On the Behaviour of Condensed Matter in Extremes: *Neil Bourne*[1]; [1]AWE

9:25 AM
Alpha/Omega Orientation Relationships and Habit Planes in Shocked Zr: *Robert Dickerson*[1]; Robert Field[1]; Juan Escobedo-Diaz[1]; Ellen Cerreta[1]; [1]Los Alamos National Laboratory

9:45 AM Invited
The Influence of Shock-loading Path and Wave Profile on the Spallation Response of Ta: *George Gray*[1]; Neil Bourne[2]; Veronica Livescu[1]; Carl Trujillo[1]; [1]Los Alamos National Laboratory; [2]AWE Aldermaston

10:05 AM Break

10:25 AM
Shock Compression Behavior of Bi-material Powder Composites with Disparate Melting Temperatures: *Kyle Sullivan*[1]; Damian Swift[1]; Matthew Barham[1]; James Stolken[1]; Joshua Kuntz[1]; Mukul Kumar[1]; [1]Lawrence Livermore National Lab

10:45 AM Invited
Instability of Explosively Collapsing Thick-walled Homogeneous and Laminate Cylinders: *Vitali Nesterenko*[1]; Karl Olney[1]; Po-Hsun Chiu[1]; Melissa Ribero Vairo[2]; Andrew Higgins[3]; Matt Serge[3]; David Benson[1]; [1]University of California, San Diego; [2]Universidad Nacinal de Cuyo; [3]McGill University

11:05 AM Invited
Fabrication of Parts for Nuclear Reactors by Explosive Compaction: *A.G. Mamalis*[1]; A. Szalay[2]; [1]Project Center for Nanotechnology and Advanced Engineering, NCSR ; [2]S-Metalltech 98 Materials Research and Development Ltd

11:25 AM
The Role of Interfaces on Shock-induced Damage in Two-phase Metals: Copper-lead: *Saryu Fensin*[1]; Ellen Cerreta[1]; George Gray[1]; Brian Patterson[1]; Steve Valone[1]; Juan Escobedo-Diaz[1]; Carl Trujillo[1]; [1]Los Alamos National Laboratory

11:45 AM
Contrasting the Microstructural Response of Cold Rolled and Annealed Copper to Shock Loading: *Daniel Higgins*[1]; Bo Pang[1]; Ian Jones[1]; Yu Lung Chiu[1]; Jeremy Millett[2]; Glenn Whiteman[2]; [1]University of Birmingham; [2]AWE

Energy Technologies and Carbon Dioxide Management — Alternative Green Processes

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Education Committee, TMS: Energy Committee
Program Organizers: Cong Wang, Northwestern University; Jan de Bakker, BBA, Inc; Cynthia Belt, Consultant; Animesh Jha, University of Leeds; Neale Neelameggham, Ind LLC; Soobhankar Pati, MOxST Inc.; Leon Prentice, CSIRO

Monday AM
February 17, 2014
Room: Balboa
Location: San Diego Marriott Marquis & Marina

Session Chairs: Cong Wang, Northwestern University; Adam Powell, INFINIUM, Inc.

8:30 AM Introductory Comments

8:35 AM Keynote
TMS Initiatives in Energy and Sustainability: *George Spanos*[1]; Justin Scott[1]; [1]The Minerals, Metals & Materials Society

8:55 AM Keynote
A Review: Solar Thermal Reactors for Materials Production: Ben Ekman[1]; *Geoff Brooks*[1]; M Rhamdhani[1]; [1]Swinburne University

9:20 AM
Liquid Metal, a Heat Transport Fluid for High Temperature Solar Concentrator Application: *Peter Hosemann*[1]; David Frazer[1]; Cristian Cionea[1]; Stephen Parker[1]; Miroslav Popovic[1]; Ouliana Panova[1]; Mark Asta[1]; [1]UC Berkeley

9:40 AM
Effect of Cu Thin Films' Thickness on the Electrical Parameters of Metal-porous Silicon Direct Hydrogen Fuel Cell: *Cigdem Oruc Lus*[1]; Sevinc Yildirim[1]; [1]Yildiz Technical University

10:00 AM Break

10:20 AM Keynote
Cool Roofs and Solar Shingles: *Husnu Kalkanoglu*[1]; [1]CertainTeed Corporation

10:45 AM
Preparation of Silica Encapsulated Stearic Acid as Composite Phase Change Material via Sol-gel Process: Xueting Liu[1]; *Hao Bai*[1]; Yuanyuan Wang[1]; Kang Zhou[1]; Hong Li[1]; [1]University of Science and Technology Beijing

11:05 AM
Ferroelectric-enhanced Photocatalysis with TiO_2/$BiFeO_3$: *Yiling Zhang*[1]; Gregory Rohrer[1]; Paul Salvador[1]; [1]Carnegie Mellon University

11:25 AM
Photochemical Activity of Heterostructured Core/Shell Particles: Nanostructured TiO_2 Shells Surrounding Microcrystalline $ATiO_3$ (A = Ba, Sr, Pb, Fe) Cores: *Li Li*[1]; Paul Salvador[1]; Gregory Rohrer[1]; [1]Carnegie Mellon University

11:45 AM
Cellulose Acetate Membranes for CO_2 Separation from Water-gas-shift Reaction Products: *Naidu Seetala*[1]; Upali Siriwardane[2]; Tushar Kudale[2]; [1]Gramblimg State University; [2]Louisiana Tech University

Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention — Emerging Technologies for Data-driven Fatigue Descriptions

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Antonios Kontsos, Drexel University; Tongguang Zhai, University of Kentucky

Monday AM
February 17, 2014
Room: 7B
Location: San Diego Convention Center

Session Chairs: Antonios Kontsos, Drexel University; Tongguang Zhai, University of Kentucky

8:30 AM Introductory Comments

8:35 AM Keynote
Advances in Fatigue Crack Growth Modeling: *Huseyin Sehitoglu*[1]; Piyas Chowdury[1]; Garrett Pataky[1]; Richard Rateick[2]; Hans Maier[3]; [1]University of Illinois; [2]Honeywell Aerospace; [3]University of Hannover

9:15 AM Invited
Exploiting MEMS Technologies to Investigate the Fatigue Properties of Micro and Nano Scale Materials: *Olivier Pierron*[1]; [1]Georgia Institute of Technology

9:35 AM Invited
X-Ray Micro Computed Tomography Based Study of the Effects of Copper-rich Segregation Structures on Microstructurally-small Fatigue-crack Propagation in Al-Cu Alloys: *Jacob Hochhalter*[1]; Vipul Gupta[2]; John Newman[1]; F Parker[1]; Scott Willard[3]; Edward Glaessgen[1]; Stephen Smith[1]; [1]NASA LaRC; [2]National Institutue of Aerospace; [3]Science & Technology Co

9:55 AM Invited
High-temperature Creep-Fatigue Behavior Study of INCONEL Alloy 617 by In Situ Neutron Diffraction: Bo-Han Wu[1]; Yu-Lih Huang[1]; Harjo Stefanus[2]; *E-Wen Huang*[1]; Gong Wu[2]; [1]National Central University; [2]High Energy Accelerator Research Organization

10:15 AM Break

10:35 AM Invited
Microstructure-sensitive Fatigue using a Quantitative NDE Approach: *Antonios Kontsos*[1]; Kavan Hazeli[1]; Jefferson Cuadra[1]; Rami Carmi[1]; [1]Drexel University

10:55 AM
SEM Study of Fatigue Crack Growth Behavior in Duplex Stainless Steels: *Ru Lin Peng*[1]; Guo-Cai Chai[2]; Sten Johansson[1]; Robert Eriksson[1]; [1]Linköping University; [2]Sandvik Materials Technology

11:15 AM
Microscale Cyclic Deformation of Nanocrystalline NiTi Shape Memory Alloys: *Hassan Ghassemi Armaki*[1]; Sharvan Kumar[1]; [1]Brown University

11:35 AM
Evolution of Short Crack Propagation in Nickel-base Superalloy Using X-ray Tomography: *Olivier Messe*[1]; Cathie Rae[1]; Joel Lachambre[2]; Jean-Yves Buffière[2]; Andrew King[3]; [1]University of Cambridge; [2]INSA Lyon; [3]Synchrotron SOLEIL

11:55 AM Concluding Comments

Fluidization Technologies for the Mineral, Materials, and Energy Industries — Fluidization Technologies for the Mineral, Materials, and Energy Industries

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
Program Organizers: Jerome Downey, Montana Tech of the Univ of Montana; Lawrence May, Hazen Research, Inc.

Monday AM
February 17, 2014
Room: 17B
Location: San Diego Convention Center

Session Chairs: Jerome Downey, Montana Tech of the University of Montana; Lawrence May, Hazen Research, Inc.

8:30 AM Invited
Fluidized Bed Technology in Practical Examples: *Andre Krzysik*[1]; [1]Metso Minerals

8:55 AM Invited
Fluidized Bed Applications for the Minerals Industry and Renewable Energy: *Marcus Runkel*[1]; Andreas Wirtz[2]; Joerg Hammerschmidt[2]; Kent Pope[3]; [1]Outotec (USA) Inc.; [2]Outotec GmbH; [3]Outotec (USA) Inc., Energy Technology Center

9:20 AM Invited
Evaluating a Fluidized-bed Process through Applied Research and Development: A Practical Approach to a Successful Project: *Lawrence May*[1]; Harry Mudgett[1]; [1]Hazen Research, Inc.

9:45 AM
Experiment Study on Elutriation Characteristics of Slag Bearing High Titania in Gas-solid Fluidized Bed: *Guoliang Yin*[1]; Liangying Wen[1]; Hailong Liang[1]; [1]Chongqing University

10:10 AM Break

10:20 AM Invited
Energy Efficient Fluidized Bed Systems: *Kamal Adham*[1]; [1]Hatch Ltd.

10:45 AM Invited
The Use of Pilot Scale Fluidized Beds for the Development of a Commercial Plant Design: *Jesse White*[1]; Arlin Olson[2]; [1]Hazen Research, Inc; [2]THOR Treatment Technologies

11:10 AM
Advanced Green Petroleum Coke Calcination In Electrothermal Fluidized Bed: Aleksandr Kozlov[1]; Yaroslav Chudnovsky[1]; Mark Khinkis[1]; *Huajun Yuan*[2]; Mark Zak[3]; [1]Gas Technology Institute; [2]Superior Graphite; [3]Industrial Consultant

11:35 AM
Study on Phosphorus Removal of High-phosphorus Iron Ore by Microwave Carbothermic Reduction and Separation: *Zhou Cai*[1]; [1]Chongqing University of Science and Technology

Gamma TiAl Alloys 2014 — Session I

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Titanium Committee
Program Organizers: Young-Won Kim, Gamteck, Inc.; Wilfried Smarsly, MTU Aero Engines GmbH; Junpin Lin, University of Science and Technology Beijing; Dennis Dimiduk, Air Force Research Laboratory; Fritz Appel, Helmholtz Zentrum Geesthacht

Monday AM
February 17, 2014
Room: 6B
Location: San Diego Convention Center

Session Chairs: Wilfried Smarsly, MTU Aero Engines GmbH; Juraj Lapin, Slovak Academy of Sciences

8:30 AM Introductory Comments

8:40 AM Invited
The Industrialization of Near-net Shape Titanium Aluminide Investment Castings: *Paul McQuay*[1]; [1]Precision Castparts Corp

9:10 AM
Study on Hot-cracking of TiAl-based Alloys: *Tian Jing*[1]; Masayuki Nishida[2]; Xiao Shulong[1]; Xu Lijuan[1]; M. Rifai Muslih[3]; Chen Yuyong[1]; [1]Harbin Institute of Technology; [2]Kobe City College of Technology; [3]National Nuclear Energy Agency in Indonesia

9:30 AM Invited
A Quarter Century Journey of Boron as a Grain Refiner in TiAl Alloys: *Dawei Hu*[1]; [1]University of Birmingham

9:55 AM
Response of Melt Treatment on the Solidified Microstructure of Ti48Al2Cr2Nb Alloy: *Hongchao Kou*[1]; Guang Yang[1]; Jun Wang[1]; Rui Hu[1]; Jinshan Li[1]; [1]Northwestern Polytechnical University

10:15 AM Break

10:35 AM Invited
Near-net-shape Casting of TiAl Components for Aero Engine Applications: A Casting Process Evaluation: *Julio Aguilar*[1]; Oliver Kaettlitz[1]; Todor Stoyanov[1]; Ruediger Tiefers[1]; Santhanu Jana[1]; [1]Access e.V.

11:00 AM
Impact of ISM Crucible Tilting Process on Mould Filling and Yield of Near-net Shape TiAl Turbine Blades: *Oliver Kaettlitz*[1]; Julio Aguilar[1]; Santhanu Jana[1]; [1]Access e.V.

11:20 AM
Effect of Centrifugal Force and Pouring Atmosphere on Casting Quality of TiAl Base Alloys: *Seung Eon Kim*[1]; Seong Woong Kim[1]; Jae Keun Hong[1]; Young Sang Na[1]; Jong Moon Park[2]; Myung Hoon Oh[2]; Dongyi Seo[3]; Young Jig Kim[4]; [1]Korea Institute of Materials Science; [2]Kumoh National Institute of Technology; [3]National Research Council Canada; [4]Sung Kyun Kwan University

11:40 AM
Fracture and Fatigue Crack Growth Behavior of Cast Titanium Aluminide: *Mohsen Seifi*[1]; Matt Dahar[1]; Petharnan Subramanian[2]; Bernard Bewlay[2]; John Lewandowski[1]; [1]Case Western Reserve University; [2]GE Global Research Center

High-temperature Gamma (f.c.c.) /Gamma-Prime (L12 structure) Co-Al-W Based Superalloys — Diffusion Behavior and Phase Equilibria

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee
Program Organizers: David Seidman, Northwestern University; David Dunand, Northwestern University; Chantal Sudbrack, NASA Glenn Research Center; Carelyn Campbell, National Institute of Standards and Technology; Ursula Kattner, National Institute of Standards and Technology; David Dye, Imperial College

Monday AM
February 17, 2014
Room: 5A
Location: San Diego Convention Center

Session Chairs: Carelyn Campbell, National Institute of Standards and Technology ; Ursula Kattner, National Institute of Standards and Technology

8:30 AM Introductory Comments

8:35 AM Plenary
Recent Progress in Co-Base Superalloy: *Kiyohito Ishida*[1]; [1]Tohoku University

9:15 AM Invited
Interdiffusion and Atomic Mobility in f.c.c Co-Al Based Ternary Alloys: *Yuwen Cui*[1]; Jose M. Torralba[1]; Toshihiro Omori[2]; Ryosuke Kainuma[2]; Kiyohito Ishida[2]; [1]IMDEA Materials Institute; [2]Tohoku University

9:45 AM
The Effect of Quaternary Alloying Additions on Diffusivity in the Co-Al-W System: *Robert Rhein*[1]; Tresa Pollock[1]; [1]University of California Santa Barbara

10:05 AM Break

10:25 AM Invited
A Many Fold Way to Model the Thermodynamics of Co-Al-W: *Suzana Fries*[1]; Mauro Palumbo[2]; Abed Al Hasan Breidi[2]; Joerg Kossmann[1]; Thomas Hammerschmidt[1]; Steffen Neumeier[3]; Mathias Goeken[3]; [1]ICAMS, Ruhr University Bochum; [2]ICAMS SKTS; [3]GMP, University Erlangen-Nuernberg

10:55 AM Invited
Phase Equilibria in the Ternary Co-W-Al Alloy System: *Eric Lass*[1]; [1]NIST

11:25 AM
Stability of TCP Phases in Co-based Superalloys: Comparison of Ab Initio Results with Structure Maps: *Jörg Koßmann*[1]; Ralf Drautz[1]; Thomas Hammerschmidt[1]; [1]ICAMS, Ruhr-University Bochum

11:45 AM
Thermodynamic Database for High Temperature Co-based Superalloys: *Jun Zhu*[1]; Chuan Zhang[1]; Weisheng Cao[1]; Shuanglin Chen[1]; Fan Zhang[1]; [1]Computherm LLC

High-temperature Material Systems for Energy Conversion and Storage — High Temperature Separation Membranes & Energy Conversion Materials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee
Program Organizers: Kyle Brinkman, Savannah River National Laboratory (SRNL); Xingbo Liu, West Virginia University; Kevin Huang, University of South Carolina

Monday AM
February 17, 2014

Room: Carlsbad
Location: San Diego Marriott Marquis & Marina

Session Chairs: Frank Chen, University of South Carolina; Junhang Dong, University of Cincinnati

8:30 AM Invited
First Principles Modeling of Hydrogen Permeation through Intermetallic Alloys, Amorphous Metals, and Proton Conducting Perovskites: *David Sholl*[1]; Rongshun Zhu[1]; Nita Chandrasekhar[1]; [1]Georgia Tech

9:00 AM
Cost-effective Low-temperature Protonic Ceramic Fuel Cells: *Jianhua Tong*[1]; Meng Shang[1]; Daniel Clark[1]; Stefan Nikodemski[1]; Phil Parilla[2]; David Ginley[2]; Joseph Berry[2]; Ryan O'Hayre[1]; [1]Colorado School of Mines; [2]National Renewable Energy Laboratory

9:20 AM
Active Metals Surface Modified $BaCo_{0.7}Fe0_{.2}Nb_{0.1O3}$-d Membranes for Hydrogen Production from Coke Oven Gas: *Wei Tao*[1]; Hongwei Cheng[1]; Naijun Zhang[1]; Xionggang Lu[1]; [1]Shanghai University

9:40 AM
Multi-scale Membrane Design: *Kyle Brinkman*[1]; Kenneth Reifsnider[2]; Frank Chen[2]; Fazle Rabbi[2]; Lin Ye[2]; Wilson Chiu[3]; William Harris[3]; Dong Su[4]; Yong Chu[4]; Jun Wang[4]; Yu-chen (Karen) Chen-Wiegart[4]; [1]Savannah River National Laboratory (SRNL); [2]University of South Carolina; [3]University of Connecticut; [4]Brookhaven National Laboratory

10:00 AM Break

10:20 AM
Characterization of La_2NiO_4+d Infiltrated $La_{0.6}Sr0.4Co_{0.8}Fe0_{.2O3}$-d Cathode for Solid Oxide Fuel Cells: Xinxin Zhang[1]; Hui Zhang[1]; *Xingbo Liu*[1]; [1]West Virginia University

10:40 AM
Thermoelectric Energy Conversion in Transient Thermal Gradients: *Jeffrey Fergus*[1]; Kirk Yerkes[2]; Kevin Yost[2]; Ryan Snyder[2]; [1]Auburn University; [2]Wright-Patterson Air Force Reseach Lab

11:00 AM
Antiferromagnetic and Expansion Behavior of Alkaline-doped Lanthanum Ferities: *Patrick Price*[1]; Geoffrey Beausoleil[1]; David Thomsen[1]; Darryl Butt[1]; [1]Boise State University

11:20 AM
High Temperature Composite in Coating of Petrochemistry Reactors: *Ilyoukha Nickolai*[1]; Valentina Timofeeva[1]; [1]Academic Ceramic Center

11:40 AM
The Impact of Temperature and Chemistry on Phase Equilibria in Coal-petcoke Gasification Slags Containing High Vanadium Oxide: *Jinichiro Nakano*[1]; Kyei-Sing Kwong[1]; James Bennett[1]; Xueyan Song[2]; Anna Nakano[1]; [1]US DOE NETL; [2]West Virginia University

Hume-Rothery Award Symposium: Thermodynamics and Kinetics of Engineering Materials — Thermodynamic Modeling and Phase Diagrams

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee
Program Organizers: Hans Juergen Seifert, Karlsruhe Institute of Technology (KIT); Alan Luo, The Ohio State University; Peter Uggowitzer, ETH Zürich; Fan Zhang, CompuTherm, LLC

Monday AM
February 17, 2014

Room: 6C
Location: San Diego Convention Center

Session Chairs: Hans Juergen Seifert, Karlsruhe Institute of Technology (KIT); Fan Zhang, CompuTherm

8:30 AM Invited
Phase Diagrams - The Beginning of Wisdom: *Rainer Schmid-Fetzer*[1]; [1]Clausthal University of Technology

9:10 AM Invited
Broad Guidelines in Predicting High-entropy Alloy Formation: *Yong Zhang*[1]; [1]University of Science and Technology Beijing

9:30 AM
Ab Initio Prediction of Chemical Trends for Phase Transitions in Magnetic Shape Memory Alloys: Biswanath Dutta[1]; *Tilmann Hickel*[1]; Jörg Neugebauer[1]; [1]Max-Planck-Institut fuer Eisenforschung GmbH

9:50 AM
Modeling of Thermal Vacancies in Metals within the Framework of the Compound Energy Model: *Peter Franke*[1]; [1]Karlsruhe Institute of Technology

10:10 AM Break

10:30 AM Invited
Progress of First-principles Study on Phase Equilibria by Cluster Variation Method: *Tetsuo Mohri*[1]; Ying Chen[2]; [1]Hokkaido University; [2]Tohoku University

10:50 AM
Temperature-dependent Properties of TCP Phases in Re-based Alloys: *Mauro Palumbo*[1]; Suzana G Fries[1]; Dario Alfè[2]; Alain Pasturel[3]; [1]ICAMS, Ruhr-Universität Bochum; [2]University College London; [3]SIMAP, UMR CNRS-INPG-UJF 5266

11:10 AM
Thermodynamic Modeling of Liquid-gas Equilibrium in NaCl-KCl-ZnC_{12} Ternary: *Venkateswara Rao Manga*[1]; Stefan Bringuier[1]; Saivenkataraman Jayaraman[2]; Pierre Deymier[1]; Krishna Muralidharan[1]; [1]University of Arizona; [2]Massachusetts Institute of Technology

ICME: Linking Microstructure to Structural Design Requirements — ICME: Linking Microstructure to Structural Design Requirements I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Rajiv Mishra, University of North Texas; David Furrer, Pratt & Whitney; Peter Collins, University of North Texas; Charles Ward, Air Force Research Laboratory; Craig McClung, Southwest Research Institute

Monday AM
February 17, 2014
Room: 31A
Location: San Diego Convention Center

Session Chair: Rajiv Mishra, University of North Texas

8:30 AM Invited
Estimation of Bounds on Strength and Ductility in Titanium Alloys: *Paul Dawson*[1]; Marc De Graef[2]; Tresa Pollock[3]; Robert Suter[2]; Matthew Miller[1]; James Williams[4]; [1]Cornell University; [2]Carnegie Mellon University; [3]University of California, Santa Barbara; [4]Ohio State University

9:10 AM
Strategies for Embedding Validated Microstructure-sensitive Material Models to Solve Engineering Problems: *Ricardo Lebensohn*[1]; [1]Los Alamos National Laboratory

9:30 AM
Using the DAMASK Suite to Study Micro Mechanics and Crystal Plasticity of Heterogeneous Materials: *Philip Eisenlohr*[1]; Martin Diehl[2]; Pratheek Shanthraj[2]; Christoph Kords[2]; Franz Roters[2]; [1]Michigan State University; [2]Max-Planck-Institut für Eisenforschung

9:50 AM
Non-schmid Crystal Plasticity Modeling of Deformation of Single Crystal Niobium: *Aboozar Mapar*[1]; Farhang Pourboghrat[1]; Thomas Bieler[1]; Christopher Compton[2]; [1]Michigan State University; [2]National Superconducting Cyclotron Lab

10:10 AM Break

10:30 AM
Dislocation Glide through Non-randomly Distributed Point Obstacles: *Alban de Vaucorbeil*[1]; Chad Sinclair[1]; Warren Poole[1]; [1]University of British Columbia

10:50 AM
Crystal Plasticity Finite Element Modeling of Heterogeneous Deformation of Pb-free Tin Based Solder Joints: Payam Darbandi[1]; *Farhang Pourboghrat*[1]; Thomas Bieler[1]; Tae-kyu Lee[1]; [1]Michigan State University

Length Scaling of Lamellar and Patterned Microstructures During Solid-Solid Phase Transformations and Solidification — Nucleation and Crystallographic Effects

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee, TMS: Solidification Committee
Program Organizers: Robert Hackenberg, Los Alamos National Lab; Carlos Capdevila-Montes, CENIM-CSIC; Amy Clarke, Los Alamos National Laboratory; John Perepezko, University of Wisconsin-Madison

Monday AM
February 17, 2014
Room: 32A
Location: San Diego Convention Center

Session Chairs: Tadashi Furuhara, Tohoku University; Jeffrey Hoyt, McMaster University

8:30 AM Invited
Effects of Ferrite/Austenite Orientation Relationship on Pearlite Transformation and Interphase Precipitation of Alloy Carbide: *Goro Miyamoto*[1]; Yongjie Zhang[1]; Yosuke Karube[2]; Tadashi Furuhara[1]; [1]Tohoku University; [2]Nippon Steel & Sumitomo Metal

9:00 AM Invited
Molecular Dynamics Simulation of Nucleation and Growth of Ferrite from Austenite: *Jeffrey Hoyt*[1]; Huajing Song[1]; [1]McMaster University

9:30 AM Invited
Symmetry of Austenite Diffusional Transformation Products in Steel: *Annika Borgenstam*[1]; [1]KTH

10:00 AM Break

10:20 AM Invited
Pattern Formation in Pearlite Structure: A View from Ferrite Crystallography: *Tadashi Furuhara*[1]; [1]Tohoku University

10:50 AM
Elastic Interactions between Lamellar Structural Units within LPSO Structure in Magnesium Alloys: *Xinfu GU*[1]; Tadashi Furuhara[1]; [1]Institute for Materials Research, Tohoku University, Japan

11:15 AM Invited
Enhanced Nucleation of the fcc-phase in Liquid Metals by Icosahedral Quasicrystals: *Michel Rappaz*[1]; Güven Kurtuldu; [1]EPFL

Long-term Stability of High Temperature Materials — Phase Changes in Bulk Material

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee
Program Organizers: Mark Hardy, Rolls-Royce plc; Awadh Pandey, Pratt & Whitney Rocketdyne; David Mourer, General Electric Aircraft Engines; Jeffrey Hawk, National Energy Technology Laboratory

Monday AM
February 17, 2014
Room: 4
Location: San Diego Convention Center

Session Chairs: Mark Hardy, Rolls-Royce plc; Jeffrey Hawk, National Energy Technology Laboratory

8:30 AM
Microstructural Stability in Advanced 9% Cr Martensitic Steel: *Jeffrey Hawk*[1]; Paul Jablonski[1]; [1]U.S. Department of Energy, National Energy Technology Laboratory

8:50 AM
Phase Stability in High Cobalt-containing Nickel-based Superalloys: *Katerina Christofidou*[1]; Nicholas Jones[1]; Steffen Neumeier[2]; Mark Hardy[3]; Howard Stone[1]; [1]University of Cambridge; [2]University of Erlangen-Nuremberg; [3]Rolls-Royce plc

9:10 AM
Nano Twinning Induced Toughening in Alloy 617 with Long Term Ageing: *Guocai Chai*[1]; Mattias Calmunger[2]; Sten Johansson[2]; Johan Moverare[2]; [1]Sandvik Materials Technology; [2]Linköping University

9:30 AM
High Temperature Stability of High Entropy Alloys: *Nicholas Jones*[1]; Aligi Frezza[2]; Bryce Conduit[3]; John Aveson[1]; Howard Stone[1]; [1]University of Cambridge; [2]University of Padova; [3]Rolls-Royce plc

9:50 AM
Atomic Imaging of M2B-type Boride in Nickel-based Superalloy: *Xiaobing Hu*[1]; Yinlian Zhu[1]; Xiuliang Ma[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

10:10 AM Break

10:30 AM
The Role of Al:Nb Ratio and Long Term Exposure Temperature on the Precipitate Distribution of Nickel Base Superalloys: *Paul Mignanelli*[1]; David Collins[2]; Bryce Conduit[3]; Ayan Bhowmik[1]; Nicholas Jones[1]; Mark Hardy[3]; Howard Stone[1]; [1]University of Cambridge; [2]University of Oxford; [3]Rolls-Royce plc

10:50 AM
Microstructural Changes in Inconel® Alloy 740 after Long-term Aging in the Presence and Absence of Stress: *Peter Tortorelli*[1]; K.A. Unocic[1]; J.P. Shingledecker[2]; [1]Oak Ridge National Laboratory; [2]Electric Power Research Institute

11:10 AM
Coarsening Mechanism for Y-Ti-O Nanofeatures in Aged MA_{957}: *Nicholas Cunningham*[1]; G. Odette[1]; Matthew Alinger[2]; Doug Klingensmith[1]; [1]UC Santa Barbara; [2]GE Global Research

11:30 AM
Microstructure Stability of a Ni-Cr-W Superalloy Subjected to Long-term Aging to Elevated Temperature: *Rui Hu*[1]; Yang Chen[1]; Hongchao Kou[1]; Tiebang Zhang[1]; Jinshan Li[1]; [1]State Key Lab of Solidification Processing,Northwestern Polytechnical University

Magnesium Technology 2014 — Keynote Session

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Martyn Alderman, Magnesium Elektron; Norbert Hort, Helmholtz-Zentrum Geesthacht; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

Monday AM
February 17, 2014
Room: 17A
Location: San Diego Convention Center

Session Chair: Martyn Alderman, Magnesium Elektron

8:30 AM Introductory Comments: Welcome and Review of Magnesium Committee Meeting

8:35 AM Award Presentation: Best Paper and Poster Awards from Magnesium Technology 2013 in San Antonio

8:45 AM Keynote
Automotive Magnesium: Impacts and Opportunities: *William Joost*[1]; [1]U.S. Department of Energy

9:20 AM Keynote
Alloy Development, Manufacturing and Design for Magnesium Applications: *Alan Luo*[1]; [1]The Ohio State University

9:50 AM Break

10:10 AM Keynote
Life Cycle Assessment of Eco-Magnesium Alloy Produced by Green Metallurgy EU Project Process Route: *Fabrizio D'Errico*[1]; Gerardo Plaza; Franz Giger[2]; Shae K. Kim[3]; [1]Politecnico di Milano; [2]Buhler AG; [3]Korea Institute of Industrial Technology

10:40 AM Invited
The IMA Study on the Life Cycle Assessment (LCA) of Magnesium: *Horst Friedrich*[1]; Simone Ehrenberger[1]; [1]Institute of Vehicle Concepts, German Aerospace Centre (DLR)

11:10 AM
Dynamic Behaviour of a Rare Earth Containing Mg Alloy, $WE_{43}B$-T_5, Plate with Comparison to Conventional Alloy, AM_{30}-F: *Sean Agnew*[1]; Jishnu Bhattacharyya[1]; Matt Shaeffer[2]; Kaliat Ramesh[2]; Wilburn Wittington[3]; Andrew Oppedal[3]; Haitham El Kadiri[3]; Richard DeLorme[4]; Bruce Davis[4]; [1]University of Virginia; [2]John Hopkins University; [3]Mississippi State University; [4]Magnesium Elektron, North America

11:40 AM
Thermodynamic and Kinetic Calculations for TRC (Twin Roll Casting) Mg Alloy Design: *In-Ho Jung*[1]; Manas Paliwal[1]; [1]McGill University

Materials and Fuels for the Current and Advanced Nuclear Reactors III — Fuels I

Sponsored by: TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee
Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Monday AM
February 17, 2014
Room: 33C
Location: San Diego Convention Center

Session Chair: Ramprashad Prabhakaran, Idaho National Laboratory

8:30 AM Invited
The Fuel Fabrication Capability and Uranium-molybdenum Alloy: An Overview: *Douglas Burkes*[1]; David Senor[1]; [1]Pacific Northwest National Laboratory

8:55 AM
Characterization of U-7Mo Alloy Microstructure Irradiated to High Fission Density: *Dennis Keiser*[1]; Jan-Fong Jue[1]; Jian Gan[1]; Brandon Miller[1]; Adam Robinson[1]; Pavel Medvedev[1]; [1]Idaho National Laboratory

9:10 AM
Microstructural Characteristics of As-fabricated Monolithic U-Mo Nuclear Fuels: *Jan-Fong Jue*[1]; Dennis Keiser[1]; Cynthia Breckenridge[1]; Adam Robinson[1]; Francine Rice[1]; Glenn Moore[1]; MItchell Meyer[1]; [1]Idaho National Laboratory

9:25 AM
Development of Phase Constituents and Microstructure in Monolithic U-Mo Fuel Plate Assembly during Hot Isostatic Pressing: Youngjoo Park[1]; Jongwon Kang[1]; Dennis Keiser[2]; *Yongho Sohn*[1]; [1]University of Central Florida; [2]Idaho National Laboratory

9:40 AM
The Effect of Time, Temperature and Processing on the Microstructure Development in U-10 wt% Mo: Curt Lavender[1]; *Vineet Joshi*[2]; Eric Nyberg[2]; Dean Paxton[2]; Doug Burkes[2]; [1]Pacific Northwest National Laboratory; [2]PNNL

9:55 AM Break

10:10 AM Invited
High-density Fuel Development for High Performance Research Reactors at TUM: *Winfried Petry*[1]; R Jungwirth[1]; H-Y Chiang[1]; T Zweifel[1]; H Palancher[2]; [1]Technische Universität München (Munich University of Technology); [2]CEA

10:35 AM Invited
Thermodynamics of U-Mo-Zr Alloys: Application to RERTR Nuclear Fuels: *Alexander Landa*[1]; Patrice Turchi[1]; Per Söderlind[1]; [1]Lawrence Livermore National Laboratory

11:00 AM
Thermal Stability of Uranium-rich U-Mo Alloys for Advanced Nuclear Fuels: *Joseph McKeown*[1]; Sangjoon Ahn[2]; Mark Wall[1]; Luke Hsiung[1]; Sean McDeavitt[2]; Patrice Turchi[1]; [1]Lawrence Livermore National Laboratory; [2]Texas A&M University

11:15 AM
Finite Element Analysis of the Rolling of $U_{10}Mo$ Alloy: Parametric Study on Rolling Process Parameters: *Ayoub Soulami*[1]; Curt Lavender[1]; Dean Paxton[1]; Douglas Burkes[1]; [1]Pacific Northwest National Laboratories

11:30 AM
Elevated Temperature Compression Testing of the U-10 wt% Mo Alloy: Impact of Homogenization Treatments: *Curt Lavender*[1]; Eric Nyberg[2]; Vineet Joshi[2]; Dean Paxton[2]; Doug Burkes[2]; [1]Pacific Northwest National Laboratory; [2]PNNL

11:45 AM
On the Intermetallic Phases Formed between U, Pu-based Fuels and Fe-based Alloys: *Assel Aitkaliyeva*[1]; Brandon Miller[1]; James Madden[1]; Thomas O'Holleran[1]; Bulent Sencer[1]; Rory Kennedy[1]; [1]Idaho National Laboratory

Materials Processing Fundamentals — Thermodynamic

Sponsored by: TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee
Program Organizers: James Yurko, Materion Brush Beryllium and Composites; Lifeng Zhang, University of Science and Technology Beijing; Antoine Allanore, Massachusetts Institute of Technology; Cong Wang, Northwestern University

Monday AM
February 17, 2014
Room: 11B
Location: San Diego Convention Center

Session Chair: Guillaume Lambotte, Massachusetts Institute of Technology

8:30 AM
Thermodynamic Properties of Equilibrium Phases in the Ag-Cu-S System Below 500 K: Experimental Study: *Fiseha Tesfaye*[1]; Pekka Taskinen[1]; [1]Aalto University School of Chemical Technology

8:50 AM
Iron-Carbon Phase Diagram: A Century at Variance with Chemical Thermodynamics: *Helfried Näfe*[1]; [1]University of Stuttgart

9:10 AM
Phase Relations for the Ce_2O_3-Al_2O_3-CaO System at Steelmaking Temperatures: *Ishii Makoto*[1]; Morita Kazuki[1]; [1]University of Tokyo

9:30 AM
Thermochemical Stability of Blue Ceramic Powders: *Henry A. Colorado*[1]; J Posada[2]; Oscar Restrepo; Jenn-Ming Yang; [1]University of California, Los Angeles; [2]University of California Los Angeles

9:50 AM
Effect of Water Vapor on S and P Distribution between Liquid Fe and MgO-Saturated Slag Relevant to a Flash Ironmaking Technology: *M. Yousef Mohassab-Ahmed*[1]; Hong Yong Sohn; [1]University of Utah

10:10 AM Break

10:20 AM
FEM Simulations of Material Behavior during Stationary-shoulder Friction Stir Processing: *Ali Ammouri*[1]; Ramsey Hamade[1]; [1]American University of Beirut

10:40 AM
Microstructural and Mechanical Property Changes in a Friction Stir Processed Nanolamellar Cu-Nb Composite: *Josef Cobb*[1]; John Carpenter[2]; Judy Schneider[1]; [1]Mississippi State University; [2]Los Alamos National Labs

11:00 AM
Numerical Analysis of Thermo-mechanical Behavior during Laser Cladding Process: *Tian Tang*[1]; Sergio Felicelli[1]; [1]University of Akron

11:20 AM
Surrogacy of the Be/AlSi Welding System: *Everett Criss*[1]; Marc Meyers[1]; [1]UCSD

Mechanical Behavior at the Nanoscale II — In Situ Nanomechanical Testing

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Evan Ma, Johns Hopkins University; Daniel Gianola, University of Pennsylvania; Ting Zhu, Georgia Institute of Technology; Julia Greer, California Institute of Technology

Monday AM
February 17, 2014
Room: 9
Location: San Diego Convention Center

Session Chairs: Evan Ma, Johns Hopkins University; Andrew Minor, UC Berkeley & LBL

8:30 AM Invited
New In Situ TEM Techniques for Investigating Deformation Mechanisms in Small Volumes: *Andrew Minor*[1]; [1]UC Berkeley & LBL

9:00 AM Invited
On the Occurrence of Deformation Twinning and Dislocation Plasticity in Small Scale Mg Samples: *Daniel Kiener*[1]; Jiwon Jeong[2]; Markus Alfreider[1]; Ruth Treml[1]; Sang Oh[2]; [1]University of Leoben; [2]Pohang University of Science and Technology

9:30 AM
Elasticity and Plasticity of Submicron-sized Metallic Glasses: An In Situ TEM Study: *Lin Tian*[1]; Zhi-Wei Shan[1]; Evan Ma[2]; [1]CAMP-Nano, Xi'an Jiaotong University; [2]Johns Hopkins University

9:50 AM
Experimental Test of Universality Over Boundary Conditions in Small Scale Mechanical Testing: *Robert Maass*[1]; Matthew Wraith[2]; Peter Derlet[3]; Julia Greer[1]; Karin Dahmen[2]; [1]California Institute of Technology; [2]University of Illinois at Urbana Champaign; [3]Paul Scherrer Institute

10:10 AM Break

10:30 AM Invited
Grain Boundary Dynamics in the Deformation of Nanocrystalline Metals: *David Srolovitz*[1]; Siu Sin Quek[2]; Zhaoxuan Wu[2]; YongWei Zhang[2]; [1]University of Pennsylvania; [2]Institute of High Performance Computing

11:00 AM
Temperature and Strain-rate Dependent Dislocation Nucleation in Pd Nanowhiskers: Lisa Chen[1]; Soraya Terrab[1]; Gunther Richter[2]; *Daniel Gianola*[1]; [1]University of Pennsylvania; [2]Max-Planck-Institute for Intelligent Systems

11:20 AM
In Situ Observations of Stress-Coupled Grain Boundary Migration in Nanocrystalline Metals: *Paul Rottmann*[1]; Marc Legros[2]; Saritha Samudrala[3]; Frederic Mompiou[2]; Kevin Hemker[1]; Julie Cairney[3]; [1]Johns Hopkins University; [2]CEMES-CNRS; [3]University of Sydney

11:40 AM
Fracture in Nanostructures with Pre-fabricated Notches: *X. Wendy Gu*[1]; David Chen[1]; Zhaoxuan Wu[2]; Yong-Wei Zhang[2]; David Srolovitz[3]; Julia Greer[1]; [1]Caltech; [2]Institute of High Performance Computing; [3]University of Pennsylvania

Multiscale Approaches to Hydrogen-assisted Degradation of Metals — Overview of Key Issues & Research Directions

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Nicholas Winzer, Fraunhofer IWM; Matous Mrovec, Fraunhofer IWM; Brian Somerday, Sandia National Laboratories; Petros Sofronis, University of Illinois; David Bahr, Purdue University; Srinivasan Rajagopalan, ExxonMobil Research and Engineering Company

Monday AM
February 17, 2014
Room: 11A
Location: San Diego Convention Center

Session Chairs: Reiner Kirchheim, Universität Göttingen; William Gerberich, University of Minnesota

8:30 AM Invited
Connecting Hydrogen-enhanced Plasticity with the Fracture Mechanism: Megan Emigh[1]; *Ian Robertson*[2]; Petros Sofronis[1]; Kelly Nygren[1]; Akihide Nagao[3]; May Martin[1]; [1]University of Illinois; [2]University of Wisconsin-Madison; [3]JFE Steel Corporation

9:10 AM Invited
Measurement and Modeling of Hydrogen Environment Assisted Cracking in Monel K-500: *Richard Gangloff*[1]; Hung Ha[1]; James Burns[1]; John Scully[1]; [1]University of Virginia

9:50 AM Break

10:10 AM Invited
Hydrogen Embrittlement of Steels: New Observations and Modeling of Micromechanisms of Fracture: *Neeraj Thirumalai*[1]; Srinivasan Rajagopalan[2]; Ju Li; [1]ExxonMobil Development Company; [2]ExxonMobil Research and Engineering Company

10:50 AM Invited
Comparisons and Conflicts between Various Atomistic Models and between Models and Experimental Observations: Paul White[1]; *Stan Lynch*[1]; [1]Defence Science and Technology Organisation

11:30 AM
Modeling Dislocation Mediated Hydrogen Transport: *Mohsen Dadfarnia*[1]; May Martin[1]; Akihide Nagao[2]; Petros Sofronis[1]; Ian Robertson[3]; [1]University of Illinois Urbana-Champaign; [2]JFE Steel Corporation; [3]University of Wisconsin-Madison

Nanostructured Materials for Rechargeable Batteries and Supercapacitors II — Session I

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee
Program Organizers: David Mitlin, University of Alberta and NINT NRC; Reza Shahbazian-Yassar, Michigan Technological University; Peter Kalisvaart, University of Alberta and NINT NRC

Monday AM
February 17, 2014
Room: Ballroom F
Location: San Diego Marriott Marquis & Marina

Session Chairs: David Mitlin, University of Alberta; Reza Shahbazian-Yassar, Michigan Technological University

8:30 AM Invited
Se-based Positive Electrode Material for Rechargeable Battery Applications: *Ali Abouimrane*[1]; Yanjie Cui[1]; Khalil Amine[1]; [1]Argonne National Laboratory

8:45 AM Invited
Why Do Graphene Anodes Offer Superior Energy Densities as Compared to Graphitic Anodes in Li-ion Batteries?: *Nikhil Koratkar*[1]; [1]Rensselaer Polytechnic Institute

9:00 AM Invited
Stress Effect on Charge and Discharge Rate and Energy Efficiency of Li-alloy Electrodes: Yifan Gao[1]; *Min Zhou*[1]; [1]Georgia Institute of Technology

9:15 AM Invited
In Situ Aberration-corrected Scanning Transmission Electron Microscopy of Anode Materials for Li Ion Batteries: *Reza Shahbazian-Yassar*[1]; [1]Michigan Technological University

9:30 AM Invited
Complexion Engineering of Batteries and Solid-state Electrolytes: Jiajia Huang[1]; Mojtaba Samiee[1]; *Jian Luo*[1]; [1]UC San Diego

9:45 AM Invited
Understanding and Controlling the SEI in Li Ion Batteries: *Andrew Gewirth*[1]; Hadi Tavassol[1]; [1]University of Illinois

10:00 AM Break

10:15 AM Invited
Application of In Situ ec-S/TEM for Energy Storage Research: *Raymond Unocic*[1]; Robert Sacci[1]; Nancy Dudney[1]; Karren More[1]; [1]Oak Ridge National Laboratory

10:30 AM Invited
Composite Silicon Carbon Nano-fiber Anode for High Energy Advance Lithium Batteries: *Gholam-Abbas Nazri*[1]; Maryam Nazri[1]; [1]Frontier Applied Sciences and Technologies, LLC

10:45 AM Invited
Challenges in Developing High Energy Density Li-ion Batteries with High Voltage Cathodes: *Taiguang Jow*[1]; Jan Allen[1]; Oleg Borodin[1]; Samuel Delp[1]; Joshua Allen[1]; [1]Army Research Laboratory

11:00 AM Invited
First Principles Investigation on the Lithiation Behavior of Nanostructured Silicon-based Alloys and Composites: Chia-Yun Chou[1]; *Gyeong Hwang*[1]; [1]University of Texas at Austin

11:15 AM Invited
Nano-structured Lithium Battery Electrode Materials via Aerosol Assisted Synthesis: *Juchen Guo*[1]; [1]University of California, Riverside

11:30 AM Invited
Nanoporous Silicon Networks as Anodes for Lithium Ion Batteries:
Jia Zhu[1]; Xiang Zhang[1]; [1]UC Berkeley

11:45 AM Invited
Design of Nano/Microstructures for Highly Stable and Active Electrodes for Lithium Batteries: *Xiao-Dong Zhou*[1]; FuSheng Ke[1]; Ling Huang[2]; Juntao Li[2]; Shi-Gang Sun[2]; [1]University of South Carolina; [2]Xiamen University

Neutron and X-ray Studies of Advanced Materials VII: Challenges of the Future World — Diffraction Centennial - Historic Perspective and Future Challenges

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kostorz, ETH; Brent Fultz, California Institute of Technology; Peter Liaw, The University of Tennessee

Monday AM
February 17, 2014
Room: 10
Location: San Diego Convention Center

Session Chairs: Rozaliya Barabash, ORNL; Gernot Kostorz, ETH

8:30 AM Introductory Comments

8:40 AM Keynote
Local Structure in Wüstite, $Fe_{1-x}O$, by Single Crystal Diffuse Scattering and PDF Analysis: *Richard Welberry*[1]; Darren Goossens[1]; [1]Australian National University

9:20 AM Invited
A Case Study in Future Energy Challenges: Towards In Situ Hard X-ray Microscopy of Photovoltaic Systems: *Jörg Maser*[1]; Barry Lai[1]; Ross Harder[1]; Tonio Buonassisi[2]; Mariana Bertoni[3]; [1]Argonne National Laboratory; [2]Massachusetts Institute of Technology; [3]Arizona State University

9:45 AM Invited
Neutron Scattering Studies of the Advanced Multi-phases Steels at HANARO: *Baek Seok Seong*[1]; Apichate Maneewong[1]; Eun Joo Shin[1]; Young-Soo Han[1]; Wan Chuck Woo[1]; Kye Hong Lee[1]; Eun-Young Kim[2]; Shi-Hoon Choi[2]; [1]KAERI; [2]Sunchon National Univ.

10:10 AM Break

10:20 AM Invited
New Roles for Small-angle X-ray and Neutron Scattering in Real-time Crystallography of Processes in Technological Materials: *Andrew Allen*[1]; Fan Zhang[1]; Lyle Levine[1]; Jan Ilavsky[2]; [1]NIST; [2]Argonne National Laboratory

10:45 AM Invited
A New High Energy Beamline at the Cornell High Energy Synchrotron Source: *Matthew Miller*[1]; Jay Schuren[2]; Ernest Fontes[1]; Darren Dale[1]; Margaret Koker[1]; Peter Ko[1]; Paul Shade[2]; Todd Turner[2]; [1]Cornell University; [2]Air Force Research Laboratory

11:10 AM Invited
Analyzing Diffraction Data in the 21st Century: *Brian Toby*[1]; Robert Von Dreele[1]; [1]Argonne National Lab

11:35 AM Invited
In Situ Neutron Diffraction during Multi-axial Deformation: *Steven Van Petegem*[1]; Helena Van Swygenhoven[1]; Julia Repper[1]; Werner Wagner[1]; [1]Paul Scherrer Institut

Pb-free Solders and Emerging Interconnect and Packaging Materials — High Temperature Environments

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
Program Organizers: Andre Lee, Michigan State University; Fay Hua, Intel Corporation; Tae-Kyu Lee, Cisco; John Elmer, Lawrence Livermore National Laboratory; Yan Li, Intel Corporation; Robert Kao, National Taiwan University; Fan-yi Ouyang, National Tsing Hua University; Chang-Woo Lee, Korea Institute of Industrial Technology; Won Sik Hong, Korea Electronics Technology Institute; Heugel Werner, Bosch Automovitve

Monday AM
February 17, 2014
Room: 5B
Location: San Diego Convention Center

Session Chairs: Fay Hua, Intel Corporation; Thomas Bieler, Michigan State University

8:30 AM
Development of Pb-free Composite Solder Paste to Replace High-Pb Hierarchical Solders: *Iver Anderson*[1]; Kathlene Lindley; [1]Ames Laboratory

8:50 AM
Effect of Cr and Ca Alloying Elements on the Solder Joint Reliability in Sn-0.7Cu System for High-temperature Automotive Electronics: *Won Sik Hong*[1]; A Young Kim[1]; [1]Korea Electronics Technology Institutue(KETI)

9:10 AM
The Performance of Hypereutectic Sn-Cu Pb-free Solder in Elevated Temperature Service: *Takatoshi Nishimura*[1]; Keith Sweatman[1]; [1]Nihon Superior

9:30 AM
Eutectic Al-Ge Thin Film for High-temperature Bonding: *Chia-Hao Chang*[1]; Po-Chen Lin[1]; Albert T. Wu[1]; [1]National Central Uiversity

9:50 AM
The Effect of Cr Addition on the Wetting Behavior on Cu of High Temperature $Zn_{25}Sn0_{.15}A_{10.1}$Ga-xCr Pb-free Solder: *Chin-Wei Liu*[1]; Kwang-Lung Lin[1]; [1]National Cheng Kung University

10:10 AM Break

10:30 AM
NanoCopper based Solder-free Electronic Assembly: Alfred Zinn[1]; Karl Schnabl[2]; Luke Wentlent[2]; Debora Schmitz[2]; Kevin Mootoo[2]; Jenai Beddow[1]; Ed Hauptfleisch[3]; Daniel Blass[3]; *Peter Borgesen*[2]; [1]Lockheed Martin Space Systems Company; [2]Binghamton University; [3]Lockheed Martin Mission Systems & Training

10:50 AM
Pressureless Bonding Using Cu and Sn Nanoparticles: *Toshitaka Ishizaki*[1]; Ryota Watanabe[1]; [1]Toyota Central R&D Laboratories, Inc.

11:10 AM
Mechanical Properties of Sintered Ag as a New Material for Die Bonding: Influence of the Elaboration Porosity: Vincenzo Caccuri[1]; *Xavier Milhet*[1]; Pascal Gadaud[1]; Denis Bertheau[1]; Michel Gerland[1]; [1]Pprime Institute UPR CNRS 3346

11:30 AM
Pressure-less Si Wafer Bonding Using Sputtered Ag Thin Films: *Chulmin Oh*[1]; Shijo Nagao[1]; Katsuaki Suganuma[1]; [1]ISIR, Osaka University

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIII — Interfacial Reactions of the Pb-free Solder Joints

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee
Program Organizers: Chao-hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Ikuo Ohnuma, Tohoku University; Clemens Schmetterer, Forschungszentrum Juelich GmbH.; Yee-Wen Yen, National Chung Cheng University; Shien Ping Feng, The University of Hong Kong; Shih-Kang Lin, National Cheng Kung University

Monday AM
February 17, 2014
Room: 32B
Location: San Diego Convention Center

Session Chairs: Chao-Hong Wang, National Chung Cheng University; Yee-wen Yen, National Taiwan University of Science and Technology

8:30 AM Invited
Suppression of Cu_3Sn in High Cu Content Pb-free Solders: *Kazuhiro Nogita*[1]; Stuart McDonald[1]; Guang Zeng[1]; Jonathan Read[1]; Takatoshi Nishimura[2]; [1]The University of Queensland; [2]Nihon Superior Co. Ltd.

8:50 AM
Interfacial Reactions between Sn and Ni-xW Alloys: *Chao-Wei Chiu*[1]; Yee-Wen Yen[1]; [1]National Taiwan University of Science & Technology

9:10 AM
Interfacial Reaction and Mechanical Characterization of Sn-Ag-Cu/Au/Pd(P)/Cu Solder Joints: Thick Pd(P) Case: *Hsin-Hui Hua*[1]; Shih-Ju Wang[1]; Tsai-Tung Kuo[1]; Cheng-En Ho[1]; [1]Yuan Ze University

9:30 AM
Influence of Ni/Zn on the Interfacial Reactions between Sn-0.7Cu Solder and Cu Substrates: *Guang Zeng*[1]; Stuart McDonald[1]; Qinfen Gu[2]; Hideyuki Yasuda[3]; Yasuko Terada[4]; Kazuhiro Nogita[1]; [1]The University of Queensland; [2]The Australian Synchrotron; [3]Kyoto University; [4]Japan Synchrotron Radiation Research Institute

9:50 AM
Channel Formation in Cu_6Sn_5 and Cu_{3S}n Layers during Reflowing: *Wei-Lan Chiu*[1]; Chien-Min Liu[1]; Yi-Sa Huang[1]; Chih Chen[1]; [1]National Chiao Tung University

10:10 AM Break

10:30 AM Invited
Kinetics of Reactive Diffusion between Co and Sn at Solid-state Temperatures: *Masanori Kajihara*[1]; Minho O[1]; [1]Tokyo Institute of Technology

10:50 AM
Interfacial Reactions of Sn-Zn Solders with Pd and Au/Pd/Ni Substrates: *Chao-hong Wang*[1]; Po-yi Li[1]; Chun-wei Chiu[1]; [1]National Chung Cheng University

11:10 AM
Microstructure and Phase Transformation of Cu-Sn Intermetallics in Microbumps: Cheng-En Ho[1]; Ling-Huang Hsu[1]; Hsin-Hui Hua[1]; *Shih-Ju Wang*[1]; [1]Yuan Ze University

11:30 AM
Interfacial Reactions between Sn-4Ag-0.5Cu Solder and Ni-coated Bi_2Te_3 Substrate: *Chih Fan Lin*[1]; Shien Ping Tony Feng[2]; Nga Yu Hau[2]; Chih Ming Chen[1]; [1]National Chung Hsing University; [2]University of Hong Kong

Phase Transformation and Microstructural Evolution — Carbon Redistribution in Steels I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee
Program Organizers: Amy Clarke, Los Alamos National Laboratory; Sudarsanam Suresh Babu, The Ohio State University; Ning Ma, ExxonMobile Research & Engineering; Tadashi Furuhara, Tohoku University; Frédéric Danoix, Université de Rouen; Mohamed Gouné, University of Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC); Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Vijay Vasudevan, University of Cincinnati; Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory; Chad Sinclair, University of British Columbia

Monday AM
February 17, 2014
Room: 31C
Location: San Diego Convention Center

Session Chairs: Mohamed Gouné, Université Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC)

8:30 AM Invited
Modeling of Carbon Diffusion in Fe-C Martensite Phase: *Helena Zapolsky*[1]; Mykola Lavrskyi[1]; Marilyne Certain[1]; Frderic Danoix[1]; Armen Khachaturyan[2]; [1]University of Rouen; [2]University of Rutgers

9:00 AM
Carbon Ordering in Ferrite: Stability and Diffusion by Atomistic Simulation in High-carbon Ferrite: *Benjamin Lawrence*[1]; Chad Sinclair[1]; Michel Perez[2]; [1]University of British Columbia; [2]INSA-Lyon

9:20 AM
Decomposition of Cementite under Strain in Pearlitic Steels: An Ab Intio Study: *Ali Nemaollahi*[1]; Blazej Grabowski[1]; Dierk Raabe[1]; Jörg Neugebauer[1]; [1]Max-Planck Institute for Iron Research

9:40 AM Invited
Contribution of Synchrotron X-ray Diffraction to the Study of the Phase Transformation in Metallic Alloys: *Moukrane Dehmas*[1]; Elisabeth Aeby-Gautier[1]; Benoit Appolaire[2]; Benoit Denand[1]; Guillaume Geandier[1]; Sabine Denis[1]; [1]Institut Jean Lamour; [2]ONERA/LEM

10:10 AM Break

10:25 AM Invited
Redistribution of Carbon in Steel – Perspectives Using Atom Probe Tomography: *Ross Marceau*[1]; Michael Herbig[2]; Ivan Gutierrez-Urrutia[2]; Pyuck-Pa Choi[2]; Dierk Raabe[2]; [1]Deakin University; [2]Max-Planck-Institut für Eisenforschung

10:55 AM
Atom Probe Tomography Investigation of C Redistribution in Sub-zero Ms FeNiC Martensites: *Frederic Danoix*[1]; Mohamed GOUNE[2]; Sebastien ALLAIN[3]; [1]CNRS - Université de Rouen; [2]University of Bordeaux; [3]ArcelorMittal

11:15 AM Invited
Carbon Enrichment in Austenite during Ferrite Transformation and Austenite Reversion: *Goro Miyamoto*[1]; ZhenQing Liu[1]; Naoki Takayama[2]; Tadashi Furuhara[1]; [1]Tohoku University; [2]JFE Steel Corporation

11:45 AM
Microstructural Development at the Nanoscale in Quench and Tempered 4340 Steel: *Amy Clarke*[1]; Michael Miller[2]; Robert Field[1]; Paul Gibbs[1]; Kester Clarke[1]; David Alexander[1]; Kathy Powers[1]; Daniel Coughlin[1]; George Krauss[3]; [1]Los Alamos National Laboratory; [2]Oak Ridge National Lab; [3]Colorado School of Mines

12:05 PM
Precipitation Sequence in a Dual Precipitation Medium Carbon Martensitic Steel Aged at 500°C: *Frederic Danoix*[1]; Raphaële Danoix[2]; Denis Delagnes[3]; [1]CNRS - Université de Rouen; [2]Normandy University; [3]Institut Clement ADER

Progress Towards Rational Materials Design in the Three Decades Since the Invention of the Embedded Atom Method: An MPMD Symposium in Honor of Dr. Michael I Baskes — Recent Advances in Interatomic Potentials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Srinivasan Srivilliputhur, University of North Texas; Amit Misra, Los Alamos National Laboratory; Neville Moody, Sandia National Laboratories; Stephen Foiles, Sandia National Laboratories; Mark Asta, University of California ; Alan Needleman, University of North Texas

Monday AM
February 17, 2014
Room: 30E
Location: San Diego Convention Center

Session Chairs: Amit Misra, Los Alamos National Laboratory; Alan Needleman, University of North Texas; Srinivasan Srivilliputhur, University of North Texas

8:30 AM Keynote
A History Of The Embedded Atom Method: *Michael Baskes*[1]; [1]UCSD

9:00 AM Keynote
Importance of Directional Bonding in Studies of Screw Dislocations in BCC Transition Metals: *Vaclav Vitek*[1]; Roman Gröger[2]; [1]University of Pennsylvania; [2]Institute of Physics of Materials, Academy of Sciences of the Czech Republic

9:30 AM Invited
A Parameterized Interatomic Potential for Saturated Hydrocarbons Using the Modified Embedded-atom Method: *Sasan Nouranian*[1]; Michael Baskes[2]; Mark Tschopp[3]; Steven Gwaltney[1]; Mark Horstemeyer[1]; [1]Mississippi State University; [2]University of California, San Diego; [3]US Army Research Laboratory

9:50 AM Invited
Interatomic Potentials for Metallic Systems: Recent Progress and Applications: G. P. Purja Pun[1]; *Y. Mishin*[1]; [1]George Mason University

10:10 AM Break

10:20 AM Invited
Interatomic Forces in Iron: *Graeme Ackland*[1]; [1]University of Edinburgh

10:40 AM Invited
Modelling Carbon with Transferable Empirical Potentials: *Nigel Marks*[1]; [1]Curtin University

11:00 AM Invited
Predicting Interfacial Interactions and Surface Chemistry Using Charge Optimized Many-body (COMB) Potentials: *Susan Sinnott*[1]; Tao Liang[1]; Yu-Ting Cheng[1]; Simon Phillpot[1]; [1]University of Florida

11:20 AM Invited
MEAM with Charge Transfer for TM Oxide Modeling: Fantai Kong[1]; Hengji Zhang[1]; Roberto Longo[1]; Byeongchan Lee[2]; *Kyeongjae Cho*[1]; [1]UT Dallas; [2]Kyung Hee University

11:40 AM Invited
Ensuring Reliability, Reproducibility and Transferability in Atomistic Simulations: The Knowledgebase of Interatomic Models (openKIM.org): *Ellad Tadmor*[1]; Ryan Elliott[1]; [1]University of Minnesota

Rare Metal Extraction & Processing Symposium — Metalloids and Rare Extraction Process

Sponsored by: Associação Brasileira de Metalurgia, Materiais e Mineração – ABM, Chinese Society for Metals, Metallurgy and Materials Society of CIM, Institute of Materials, Minerals and Mining, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Neale Neelameggham, Ind LLC; Shafiq Alam, Memorial University of Newfoundland; Harald Oosterhof, Umicore; Animesh Jha, University of Leeds; Shijie Wang, Rio Tinto, Kennecott Utah Copper Refinergy

Monday AM
February 17, 2014
Room: 16B
Location: San Diego Convention Center

Session Chairs: Shafiq Alam, Memorial University of Newfoundland; Katsutoshi Inoue, Saga University

8:30 AM Introductory Comments

8:40 AM
2014 EPD Distinguished Lecture: How Critical is Recycling for Critical Materials' Sustainability?: *Brajendra Mishra*[1]; [1]Colorado School of Mines

9:20 AM
Adsorptive Recovery of Antimony (III, V) Using Metal-loaded Orange Juice Residue: *Katsutoshi Inoue*[1]; Jun-ichi Inoue[1]; Shafiq Alam[2]; [1]Saga University; [2]Memorial University

9:40 AM
The Synthesis and Stability of Yukonite: Implications in Solid Arsenical Waste Storage: *Matthew Bohan*[1]; George Demopoulos[1]; John Mahoney[2]; [1]McGill University; [2]Mahoney Geochemical Consulting LLC

10:00 AM Break

10:20 AM
The Evolving Copper-Tellurium Byproduct System: A Review of Extraction & Processing Technologies: *Michele Bustamante*[1]; Gabrielle Gaustad[1]; [1]Rochester Institute of Technology

10:40 AM
Conversion of Strontium Sulfate to Strontium Oxalate in Solutions Containing Ammonium Oxalate as Reactant: Mert Zoraga[1]; *Cem Kahruman*[1]; Ibrahim Yusufoglu[1]; [1]Istanbul University

11:00 AM
Electrodeposition of Zinc from Zinc Oxide Using Urea and Choline Chloride Mixture: Effect of Process Variables on Current Efficiency, Energy Consumption, and Surface Morphology: *Haoxing Yang*[1]; Ramana Reddy[1]; [1]The University of Alabama

11:20 AM
Effect of Physical Parameters on the Stirred Separation Process in Rare Earth Extraction System: *Wang Shuchan*[1]; Zhang Ting'an[1]; Zhang Zimu[1]; Zhao Qiuyue[1]; Liu Yan[1]; Lv Chao[1]; [1]Northeastern University

11:40 AM
Slurry Electrolysis of As-rich Antimonic Gold Concentrate Ores: *Chengyan Wang*[1]; Yongqiang Chen[1]; Yongqiang Yang[1]; Yonglu Zhang[1]; Baozhong Ma[1]; [1]Beijing General Research Institute of Mining and Metallurgy

Solid-state Interfaces III: Toward an Atomistic-scale Understanding of Structure, Properties, and Behavior through Theory and Experiment — Mechanical Properties

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Xiang-Yang Liu, Los Alamos National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Stephen Foiles, Sandia National Laboratories; Mitra Taheri, Drexel University; Rampi Ramprasad, University of Connecticut

Monday AM
February 17, 2014
Room: 6D
Location: San Diego Convention Center

Session Chair: Xiang-Yang (Ben) Liu, Los Alamos National Laboratory

8:30 AM Invited
Designing Interfaces for Maximum Strength, Deformability and Toughness in Metal-ceramic Nanocomposites: *Amit Misra*[1]; [1]Los Alamos National Laboratory

9:10 AM Invited
Viscoelasticity of Stepped Interfaces: *Michael Demkowicz*[1]; Scott Skirlo[1]; [1]Massachusetts Institute of Technology

9:50 AM
A Study of Interfacial Sliding in Cu/Nb Bicrystals: *Jason Mayeur*[1]; Irene Beyerlein[1]; Curt Bronkhorst[1]; [1]Los Alamos National Laboratory

10:10 AM Break

10:20 AM
Environment-dependent Interfacial Strength Using First Principles Thermodynamics: The Example of the Pt-HfO_2 Interface: Yenny Cardona-Quintero[1]; Ganpati Ramanath[2]; *Rampi Ramprasad*[1]; [1]University of Connecticut; [2]RPI

10:40 AM
Interfacial Migration and Deformation during Indentation-induced Grain Growth of Nanocrystalline Nickel: *Garritt Tucker*[1]; Stephen Foiles[2]; [1]Drexel University; [2]Sandia National Laboratories

11:00 AM
Atomic Scale Investigation of Grain Boundary Structure role on Deformation and Crack Growth Dynamics in Aluminum: *Ilaksh Adlakha*[1]; Kiran Solanki[1]; Mark Tschopp[2]; [1]Arizona State University; [2]Army Research Laboratory

11:20 AM
Conditions for Mechanical Equilibrium of a 4-Node in the Interfacial Network in 3D: *Vasily Bulatov*[1]; Bryan Reed[1]; Jeremy Mason[1]; Mukul Kumar[1]; [1]LLNL

Ultrafine Grained Materials VIII — Keynote Session

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Suveen Mathaudhu; Yuri Estrin, Monash University; Zenji Horita, Kyushu University; Enrique Lavernia, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuming Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Monday AM
February 17, 2014
Room: 6E
Location: San Diego Convention Center

Session Chairs: Suveen Mathaudhu; Yuntian Zhu, North Carolina State University; Yuri Estrin, Monash University

8:30 AM Invited
Breakdown of Hall-Petch Strengthening for UFG Metals at Elevated Temperatures: *Martin Heilmaier*[1]; Joachim H. Schneibel[2]; Daniel Schliephake[1]; [1]Karlsruhe Institute of Technology; [2]Formerly Oak Ridge National Laboratory

8:50 AM Invited
Dislocation Hardening Versus Softening: Size Effect: *Xiaoxu Huang*[1]; [1]Technical University of Denmark

9:10 AM Invited
Grain Boundaries and Advanced Properties of Ultrafine-grained Metals: *Ruslan Valiev*[1]; [1]Ufa State Aviation Technical University

9:30 AM Invited
Microstructural Evoluation and Superplastic Behavior in Two-phase Alloys Processed by High-pressure Torsion: Megumi Kawasaki[1]; *Terence Langdon*[2]; [1]Hanyang University; [2]Univ of Southern California

9:50 AM Invited
Grain Boundaries in Severely Deformed Metals: Effect of Deformation Temperature and Stacking Fault Energy: *Sergii Divinsky*[1]; [1]University of Münster

10:10 AM Break

10:25 AM Invited
Insight into Microstructural Evolution during Severe Plastic Deformation Processes Gained from In Situ Microscopy: *Mitra Taheri*[1]; [1]Drexel University

10:45 AM Invited
Nanocrystalline Grain Boundary Engineering Enabled by Novel Deformation Physics: *Timothy Rupert*[1]; [1]University of California, Irvine

11:05 AM Invited
Recent Developments in Grain Refinement Modeling during Severe Plastic Deformation: *Laszlo Toth*[1]; Chengfan GU[2]; [1]Université de Lorraine; [2]The University of New South Wales

11:25 AM Invited
Microstructural Design of Ultrafine Grained Magnesium Alloys through Severe Thermo-mechanical Processing: *Ibrahim Karaman*[1]; E. Dogan[1]; K. Ted Hartwig[1]; [1]Texas A&M University

11:45 AM Invited
New Insights into the Formation of Solute Nanostructures in an Al-Mg-Si Alloy during HPT Processing: *Gang Sha*[1]; Xiaozhou Liao[1]; Ruslan Valiev[2]; Maxim Murashkin[2]; Simon Ringer[1]; [1]The University of Sydney; [2]Ufa State Aviation Technical University

12:05 PM
Application of High-pressure Torsion to TiFe Hydrogen Storage Material: No Requirement for Activation: Kaveh Edalati[1]; Junko Matsuda[1]; Makoto Arita[1]; Takeshi Daio[1]; Hideaki Iwaoka[1]; Shoichi Toh[1]; Etsuo Akiba[1]; *Zenji Horita*[1]; [1]Kyushu University

2014 Functional Nanomaterials: Synthesis, Properties and Applications — Nanomanufacturing II & Fabrication and Fundamentals I

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee
Program Organizers: Nitin Chopra, The University of Alabama; Terry Xu, The University of North Carolina at Charlotte; Jiyoung Kim, University of Texas at Dallas; Yuanbing Mao, University of Texas - Pan American; Ashwin Ramasubramaniam, University of Massachusetts Amherst; Jung-kun Lee, University of Pittsburgh; Ramki Kalyanaraman, The University of Tennessee, Knoxville; Stephen Turano, Georgia Tech Research Institute

Monday PM
February 17, 2014
Room: Ballroom D
Location: San Diego Marriott Marquis & Marina

Session Chairs: Yuanbing Mao, University of Texas - Pan American; Ashwin Ramasubramaniam, University of Massachusetts Amherst; Nitin Chopra, The University of Alabama

2:00 PM
Production of Zirconia Nanofibers Using Electrospinning Method: *Durgha Rajamanikkam*[1]; [1]Anna University

2:20 PM
Rapid Synthesis and Annealing System for ZnO Thin Films Using Inductively Coupled Thermal Plasma: *Michael Kinsler*[1]; Rabiah Harrison[1]; Kyle Ng[1]; Kwok-Siong Teh[1]; [1]San Francisco State University

2:40 PM
Synthesis of Monolithic Iron Incorporated Silica Aerogels by Ambient Pressure Drying: *Xuan Cheng*[1]; Fengzuan Luo[1]; Zaidong Shao[1]; Ying Zhang[1]; [1]Xiamen University

3:00 PM
Ultrahigh Aspect-ratio Nano-gratings of Ti-Al Alloy Fabricated by a Combined Top-down Bottom-up Approach: *Yuichiro Koizumi*[1]; Daixiu Wei[1]; Akihiko Chiba[1]; Akinori Yamanaka[2]; Masahiko Yoshino[3]; Hiroaki NISHIYAMA[4]; [1]Tohoku University; [2]Tokyo University of Agriculture and Technology; [3]Tokyo Institute of Technology; [4]Yamagata University

3:20 PM
Novel Synthesis of Nanostructured Hairy Aluminum/AlOOH Core-shell Particles: *Jiaquan Xu*[1]; Marc Estruga[1]; Lianyi Chen[1]; Hongseok Choi[1]; Xiaochun Li[1]; [1]University of Wisconsin-Madison

3:40 PM Break

4:00 PM
Synthesis of Ultrahigh-density Sub 10 nm Co Nanowires Arrays by the Method of Phase Separation: *Yuan Tian*[1]; Pinaki Mukherjee[1]; Tanjore Jayaraman[1]; Zhanping Xu[1]; Jeffrey Shield[1]; Chad Briley[1]; Daniel Schmidt[1]; Li Tan[1]; Mathias Schubert[1]; [1]University of Nebraska-Lincoln

4:20 PM
A Simple Green Synthesis of Type II Water Soluble CdTe/CdS Core Shell Nanoparticles: *Oluwafemi Oluwatobi*[1]; Olamide Daramola[1]; Anda Tywabi[1]; Sandile Songca[1]; [1]Walter Sisulu University

4:40 PM
Ag Nanostructures with Various Morphologies Fabricated through Facile Wet-chemical Synthesis: *Ping Yang*[1]; Yulan Zhang[1]; [1]University of Jinan

5:00 PM
Electrochemical Oxidation of Ethanol on Mesoporous NiO Fibers in Alkaline Media: *Jing Zhan*[1]; Meng Cai[1]; Chuanfu Zhang[1]; Chen Wang[1]; [1]Central South University

5:20 PM
Effect of Co Substitution on Microwave Absorption of $BaFe_{12}O_{19}$: *Abhishek Kumar*[1]; Vijaya Agarwala[1]; Dharmendra Singh[1]; [1]IIT Roorkee

2014 TMS RF Mehl Medal Symposium on Frontiers in Nanostructured Materials and Their Applications — Keynote Session on Nanomaterials and Applications

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Ramki Kalyanaraman, University of Tennessee; Haiyan Wang, Texas A&M University; Yuntian Zhu, North Carolina State University; Justin Schwartz, North Carolina State University; Amit Goyal, Oak Ridge National Laboratories

Monday PM
February 17, 2014

Room: Ballroom E
Location: San Diego Marriott Marquis & Marina

Session Chairs: Ke Lu, Institute of Metal Research; Dieter Wolf, Argonne National Laboratory

2:00 PM Keynote
Colossal Injection of Catalyst Atoms into Epitaxial Silicon Nanowires: *David Seidman*[1]; Oussama Moutanabbir[2]; Dieter Isheim[1]; Horst Blumtritt[3]; Stephan Senz[3]; Eckhard Pippel[3]; [1]Northwestern University; [2]Ecole Polytechnique de Montreal; [3]1Max Planck Institute of Microstructure Physics

2:20 PM Keynote
Solidification Mechanisms of Carbon as Graphene, Graphite and Diamond from Metal-carbon Melts: *Reza Abbaschian*[1]; Shaahin Amini[1]; [1]University of California, Riverside

2:40 PM Keynote
Hierarchical Microstructural Architecture for High-performance Thermoelectrics: *Vinayak Dravid*[1]; [1]Northwestern University

3:00 PM Keynote
Coarsening of Nanoscale Precipitates in Al-Li Alloys: *Martin Glicksman*[1]; Ke-gang Wang[1]; Ben Pletcher[2]; [1]Florida Institute of Technology; [2]Select Arc Corp.

3:20 PM Break

3:40 PM Keynote
Fundamentals of Ion-solid Interactions in Ceramic and Structural Materials: *Steven Zinkle*[1]; [1]Oak Ridge National Laboratory

4:00 PM Keynote
Plastic Deformation in Nanoindentation of a BCC Metal: *Marc Meyers*[1]; Carlos Ruestes[1]; Tane Remington[1]; Eduardo Bringa[2]; Bruce Remington[3]; Bimal Kad[1]; [1]UCSD; [2]CONICET/U. Nacional de Cuyo; [3]LLNL

4:20 PM Keynote
Strengthening of Steels by Nanodispersoids: *G Sundararajan*[1]; R Vijay[1]; [1]ARCI

4:40 PM Keynote
Role of Dislocations during Processing and Deformation of Nanocrystalline Materials: *Farghalli Mohamed*[1]; [1]University of California,Irvine

5th International Symposium on High Temperature Metallurgical Processing — Alloy and Materials Preparation

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Mark Schlesinger, Missouri University of Science and Technology; Onuralp Yücel, ITU; Rafael Padilla, University of Concepcion; Phillip Mackey, P.J. Mackey Technology; Guifeng Zhou, Wuhan Iron and Steel

Monday PM
February 17, 2014

Room: 18
Location: San Diego Convention Center

Session Chairs: Onuralp Yücel, ITU; Tobias Dubberstein , Institute of Iron and Steel Technology

2:00 PM Introductory Comments

2:05 PM
A Refinement Study of SHS Alloys by Mini Vacuum Arc Melting System: *Murat Alkan*[1]; Seref Sonmez[1]; Bora Derin[1]; Onuralp Yucel[1]; [1]Istanbul Technical University

2:20 PM
An Investigation on the Self-propagating High Temperature Synthesis of TiB_2: *Onuralp Yucel*[1]; Mehmet Bugdayci[1]; Ahmet Turan[1]; [1]Istanbul Technical University

2:35 PM
Characteristics of Solidification Structure of Wide-thick Slab of Steel Q345: *Sen Luo*[1]; Miaoyong Zhu[1]; Weiling Wang[1]; Shuguo Zheng[1]; Fan Xu[1]; [1]Northeastern University

2:50 PM
Determination of Surface Tension for FeCrMnNi Alloy with Varying Sulfur and Phosphorus Relevant to Gas Atomization: *Tobias Dubberstein*[1]; Hans-Peter Heller[1]; [1]TU Bergakademie Freiberg

3:05 PM
Behavior Analysis of Ag in Ag-Sn-Zn Alloy: Guang-yao Xu[1]; *Yang Tian*[1]; Da-chun Liu[1]; Bin Yang[1]; Bao-qiang Xu[1]; [1]Kunming University of Science and Technology

3:20 PM
Effects of Zirconium Content on Nano Inclusion Morphology of Hull Structure Steel Plate during the High Heat Input Welding: *Guoli Liang*[1]; Shaoqiang Yuan[1]; Huibin Wu[2]; [1]Tangshan College; [2]National Engineering Research Center for Advanced Rolling Technology

3:35 PM Break

3:45 PM
Electrochemical Synthesis of TiC-transition Metal-based Complex Powder in Molten Chloride: *Qian Xu*[1]; Qiu-Shi Song[1]; Lin Sun[1]; Liang Xu[1]; [1]Northeastern University

4:00 PM
Electrolysis Contribution to the Yield of Alloy Elements and the Exchange Current Density of Manganese and Chromium during DC-Arc Steel Melting/Refining Process: *Jianbin Chen*[1]; Mao-fa Jiang[2]; [1]Shanghai Institute of Technology; [2]School of Materials and Metallurgy, Northeastern University

4:15 PM
Experimental Study of the Thermodynamics of the Fe-Nb-C Melts: *Baijun Yan*[1]; Dongdong Guo[1]; Lu Zhang[1]; Jiayun Zhang[1]; [1]University of Science and Techonology Beijing

4:30 PM
Influence of Rapid Cooling on Structure and Performance of Niobium Containing Steels: *Banglun Wang*[1]; Fenglian Wang[2]; [1]College of Materials Science and Engineering of Chongqing University; [2]School of Economics and Business Administration, Chongqing University

4:45 PM
Preparation of Nitrogenous Ferrovanadium by Gaseous Nitriding in the Liquid Phase Ferrovanadium: *Wenjuan Liu*[1]; Kai Dong[1]; Rong Zhu[1]; [1]University of Science and Technology Beijing

5:00 PM
Study on Key Technologies of 38CrMoAl Steel Produced by BOF-LF-RH-CC Process: *Yong Chen*[1]; Min Zhang[2]; Jian-hua Zeng[2]; Hong Pan[2]; [1]PANsteel Group Research Institute Co., Ltd. ; [2]PANsteel Group Research Institute Co., Ltd.

5:10 PM
The Evolution and Morphology of Sulfide Inclusions in 95CrMo Hollow Steel: *Jing Chen*[1]; Shaobo Zheng[1]; Chuanjie Cai[1]; Yongqiu Liu[1]; Huigai Li[1]; Jieming Yang[2]; [1]Shanghai University; [2]Shougang Guiyang Special Steel

5:20 PM
Electrochemically Preparing of Ni-Fe Alloys in Molten Sodium Hydroxide: *Jianbang Ge*[1]; Jiusan Xiao[1]; Shuqiang Jiao[1]; Hongmin Zhu[1]; [1]University of Science and Technology Beijing

A Lifetime of Experience with Titanium Alloys: An SMD Symposium in Honor of Jim Williams, Mike Loretto and Rod Boyer — Williams Honorary Session II: Fatigue I

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee
Program Organizers: Adam Pilchak, Air Force Research Laboratory; James Larsen, Air Force Research Laboratory; David Dye, Imperial College London; Jay Tiley, Air Force Research Laboratory

Monday PM
February 17, 2014
Room: 1A
Location: San Diego Convention Center

Session Chairs: George Gray, Los Alamos National Laboratory; Peter Collins, University of North Texas

2:00 PM Invited
The Response of Ti-alloys to Extreme Loading Environments: *George Gray*[1]; [1]Los Alamos National Laboratory

2:30 PM Invited
Creep and Fatigue of Titanium Alloys: Mechanisms and Microstructure-based Modeling: Matthew Brandes[1]; Adam Pilchak[2]; Stan Rokhlin[1]; Somnath Ghosh[3]; *Michael Mills*[1]; [1]The Ohio State University; [2]Air Force Research Laboratories; [3]Johns Hopkins University

3:00 PM
TriBeam Tomography of Ti6-4 for Plasticity Characterization: *McLean Echlin*[1]; Jean-Charles Stinville[1]; Euan Wielewski[2]; Paul Dawson[2]; Matthew Miller[2]; Tresa Pollock[1]; [1]UC Santa Barbara; [2]Cornell University

3:20 PM
Mechanisms of Damage Accumulation during Superelastic Cycling of Metastable Beta Titanium Alloys: *Vassili Vorontsov*[1]; Nicholas Jones[2]; Khandaker Rahman[1]; Oliver Joris[1]; David Dye[1]; [1]Imperial College London; [2]University of Cambridge

3:40 PM Break

4:00 PM Invited
Fatigue Characteristics and Microstructures of Laser- and Non-laser Welded Low Cost Ti-4.5Al-2.5Cr-1.2Fe-0.1C for Use in Next Generation Aircrafts: *Mitsuo Niinomi*[1]; Masaaki Nakai[1]; Junko Hieda[1]; Ken Cho[1]; Yoshio Itsumi[2]; Shogo Murakami[2]; Hideo Oyama[2]; Wataru Abe[3]; [1]Tohoku University; [2]Kobe Steel, Ltd.; [3]Kawasaki Heavy Industries, Ltd.

4:30 PM Invited
Multi-time Scaling Image Based Crystal Plasticity FE Models Dwell Fatigue Initiation in Polycrystalline Ti Alloys: *Somnath Ghosh*[1]; Michael Mills[2]; Stan Rokhlin[2]; Jim Williams[2]; [1]Johns Hopkins University; [2]The Ohio State University

5:00 PM
Reducing Uncertainties in Life Limits of Titanium Alloys in Turbine Engine Rotors: *James Larsen*[1]; Sushant Jha[2]; Christopher Szczepanski[1]; Reji John[1]; Andrew Rosenberger[1]; Michael Caton[1]; Patrick Golden[1]; Dennis Buchanan[3]; Jay Jira[1]; [1]Air Force Research Laboatory; [2]UTC; [3]University of Dayton Research Institute

5:20 PM
Combined Experimental and Computational Modeling to Understand the Role of Microstructure on Fatigue Behavior of Ti-6Al-2Sn-4Zr-2Mo-0.08Si: *Christopher Szczepanski*[1]; Adam Pilchak[1]; Sushant Jha[2]; Reji John[1]; James Larsen[1]; [1]US Air Force Research Laboratory; [2]UTC/AFRL

5:40 PM
MD Simulations of Dislocation Nucleation and Reaction during Cyclic Loading in hcp Titanium: *Dongsheng Xu*[1]; Hao Wang[1]; David Rugg[2]; Aijun Huang[3]; Rui Yang[1]; James Williams[4]; [1]Institute of Metal Research, Chinese Academy of Sciences; [2]Rolls-Royce PLC; [3]Baosteel Group Corporation; [4]Ohio State University

Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Modeling — Ion Beam Irradiation and Advanced Characterization Techniques

Sponsored by: TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee
Program Organizers: Peter Hosemann, University of California Berkeley; Julie Tucker, Knolls Atomic Power Laboratory; James Cole, Idaho National Laboratory; Todd Allen, University of Wisconsin-Madison

Monday PM
February 17, 2014
Room: 33B
Location: San Diego Convention Center

Session Chair: James Cole, Idaho National Laboratory

2:00 PM
Behavior of Fe-Cr Alloys under Ion or Neutron Irradiation: *Emmanuelle Marquis*[1]; Mukesh Bachhav[1]; Reshma Mathew[1]; G.Robert Odette[2]; [1]University of Michigan; [2]University of California, Santa Barbara

2:40 PM
Effect of Neutron Irradiation on Select Mn+1AXn Phases: *Darin Tallman*[1]; Elizabeth Hoffman[2]; El'ad Caspi[1]; Gordon Kohse[3]; Robert Sindelar[2]; Michel Barsoum[1]; [1]Drexel University; [2]Savannah River National Lab; [3]MIT Nuclear Reactor Laboratory

3:00 PM
Ion Irradiation Effects on Nanocluster Precipitation in Steels: *Z. W. Zhang*[1]; C. T. Liu[2]; X-L. Wang[2]; M. K. Miller[3]; D. Ma[3]; J. R. Williams[4]; B. A. Chin[4]; [1]Harbin Engineering University; [2]City University of Hong Kong; [3]Oak Ridge National Laboratory; [4]Auburn University

3:20 PM
Influence of Proton Irradiation on the Precipitation Kinetics and Mechanical Properties of an Intermetallic Precipitation Hardened Steel: *Christina Hofer*[1]; E. Stergar[2]; H. Leitner[1]; Y. Wang[3]; P. Hosemann[4]; [1]Montanuniversität Leoben; [2]SCKCEN Belgian Nuclear Research Center; [3]Los Alamos National Laboratory; [4]University of California, Berkeley

3:40 PM Break

4:00 PM
Characterization of Radiation Damage Tolerant Cu/Nb Nanocomposites Using Synchrotron Based X-ray Methods and Transmission Electron Microscopy: *Simerjeet Gill*[1]; Lynne Ecker[1]; Mike Demkowicz[2]; Amit Misra[3]; [1]Brookhaven National Laboratory; [2]Massachusetts Institute of Technology; [3]Los Alamos National Laboratory

4:20 PM
In Situ Measurement of Heavy-ion-irradiation-induced Plastic Flow of Amorphous CuTiAg Micropillars: *Sezer Ozerinc*[1]; Robert Averback[1]; William King[1]; [1]University of Illinois at Urbana-Champaign

4:40 PM
Contribution from Anisotropic Dislocation Loop Distribution to Irradiation Creep of F-M Steel T_{91}: *Cheng Xu*[1]; Gary Was[1]; [1]University of Michigan

5:00 PM
Relaxation Time of Transient Radiation Induced Defects: *Thomas Schenkel*[1]; Steven Lidia[1]; Peter Hosemann[2]; Andrew Minor[2]; Kin Yu[1]; Christoph Weis[1]; [1]Lawrence Berkeley National Laboratory; [2]University of California

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms — Dislocations and Plasticity

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Materials Characterization Committee, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: John Carpenter, Los Alamos National Laboratory; Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Khalid Hattar, Sandia National Laboratories; Marko Knezevic, University of New Hampshire; Irene Beyerlein, Los Alamos National Laboratory

Monday PM
February 17, 2014
Room: 8
Location: San Diego Convention Center

Session Chairs: Tom Bieler, Michigan State; Irene Beyerlein, Los Alamos National Laboratory

2:00 PM Invited
Slip and Slip Traces in BCC Metals: In Situ Laue Diffraction: *Helena Van Swygenhoven*[1]; Cecile Marichal[1]; Ainara Irastorza-Landa[1]; Steven Van Petegem[1]; Camelia Borca[1]; [1]Paul Scherrer Institut

2:30 PM Invited
Four-dimensional Deformation Studies in the Electron Microscope: Ian Robertson[1]; Josh Kacher[2]; [1]University of Wisconsin-Madison; [2]Lawrence Berkeley National Laboratory

3:00 PM Invited
Quantifying the Dislocation Structure Evolution Induced by Neutron Irradiation, Plastic Deformation and Annealing in Zr-2.5Nb by Diffraction Line Profile Analysis: *Levente Balogh*[1]; Donald Brown[2]; Paula Mosbrucker[3]; Fei Long[1]; Mark Daymond[1]; [1]Queen's University; [2]Los Alamos National Laboratory; [3]Kinectrics Inc.

3:30 PM Break

3:50 PM
Defect Analysis Using a Segmented STEM Detector: Theory and Potential Applications: *Matthew Bowers*[1]; Michael Mills[1]; Marc de Graef[1]; [1]The Ohio State University

4:10 PM
Identification of Deformation Mechanisms by Crystal Plasticity Models with Hardening Laws Based on Dislocation Density: *Marko Knezevic*[1]; Milan Ardeljan[1]; Rodney McCabe[2]; Irene Beyerlein[2]; Thomas Nizolek[3]; Nathan Mara[2]; Tresa Pollock[3]; Donald Brown[2]; Carlos Tomé[2]; [1]University of New Hampshire; [2]Los Alamos National Laboratory; [3]University of California at Santa Barbara

4:30 PM
Full Field Modeling of TWIP Steels Deformation Behavior Combining Fast Fourier Transforms and a Micromechanical Viscoplastic Texture Model: *Vahid Tari*[1]; Anthony Rollett[2]; Hossein Beladi[3]; Haitham Kadiri[1]; [1]Mississippi State University; [2]Carnegie Mellon University; [3]Deakin University

4:50 PM
Crystal Plasticity and Grain-orientation-dependent hkl-lattice Strain in Polycrystalline SUS316: *Lili Zheng*[1]; Wei Yuan[1]; Harsha Badarinarayan[1]; [1]Hitachi America Ltd

5:10 PM
Microstructure-informed Modeling of the Deformation Response of Advanced High Strength Steels: Peng Chen[1]; *Hassan Ghassemi Armaki*[1]; Shrikant Bhat[2]; Sriram Sadagopan[2]; Allan Bower[1]; Sharvan Kumar[1]; [1]Brown University; [2]ArcelorMittal

Advanced Composites for Aerospace, Marine, and Land Applications — Characterization of Composite Microstructures and Phases

Sponsored by: TMS Structural Materials Division, TMS/ASM: Composite Materials Committee
Program Organizers: Tomoko Sano, US Army Research Laboratory; Michael Peretti, GE Aviation; Tirumalai Srivatsan, The University of Akron

Monday PM
February 17, 2014
Room: 6F
Location: San Diego Convention Center

Session Chairs: Tushar Borkar, University of North Texas; Tirumalai Srivatsan, University of Akron

2:00 PM Invited
Three-dimensional Tomographic Characterization of Woven Ceramic Textile Composites under In Situ Loading at Ultrahigh Temperatures: Hrishikesh Bale[1]; Siyuan Xin[1]; Brian Cox[2]; David Marshall[2]; *Robert Ritchie*[1]; [1]University of California Berkeley; [2]Teledyne Science Center

2:40 PM
Laser Deposited In Situ TiC Reinforced Nickel Matrix Composites: Microstructure and Tribological Properties: *Tushar Borkar*[1]; Sundeep Gopagoni[1]; Junyeon Hwang[2]; Soumya Nag[1]; Jamie Tiley[3]; Rajarshi Banerjee[1]; [1]University of North Texas; [2]Korea Advance Institute of Science and Technology; [3]Airforce Research Laboratory

3:00 PM
Squeeze Infiltration Processing of Micro Silica Reinforced Aluminium-based Metal Matrix Composites: V. Resmi[1]; Prince Joseph[1]; T. Rajan[1]; B Pai[1]; Tirumalai Srivatsan[2]; *K. Sree Manu*[1]; [1]CSIR; [2]The University of Akron

3:20 PM
Fabrication and Characterization of a Hybrid Functionally Graded Metal-based Composite Using the Technique of Squeeze Infiltration: *K. Sree Manu*[1]; V. Resmi[1]; Prince Joseph[1]; T. P. Rajan[1]; B. Pai[1]; Tirumalai Srivatsan[2]; [1]; [1]CSIR; [2]The University of Akron

3:40 PM Break

4:00 PM
The Microstructure and Mechanical Properties of Magnetic Shape Memory Alloys $NiCo_{40}+xA_{130}$-x(X=0、3、6、10): *Jia Ju*[1]; Feng Xue[1]; Jian Zhou[1]; Jing Bai[1]; Huan Liu[1]; [1]Southeast University

4:20 PM
Microstructural Analysis of a Diffusion Bonded Titanium Alloy with Titanium Alloy and Titanium Alloy with Copper: *Chandrappa Kasigavi*[1]; [1]Siddaganga Institute Of Technology

4:40 PM Invited
Metal Matrix Composites Directionally Solidified: Alicia Ares[1]; *Carlos Schvezov*[1]; [1]Materials Institute of Misiones (IMAM)-Faculty of Sciences (FCEQyN-UNaM)

Advanced Materials for Power Electronics, Power Conditioning, and Power Conversion II — Capacitor and Dielectric Materials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee, TMS: Magnetic Materials Committee
Program Organizers: Paul Ohodnicki, National Energy Technology Laboratory; Michael McHenry, Carnegie Mellon University; Matthew Willard, Case Western Reserve University; Rachael Myers-Ward, NRL; Mike Lanagan, Penn State University; Clive Randall, Penn State University

Monday PM
February 17, 2014
Room: Cardiff
Location: San Diego Marriott Marquis & Marina

Session Chair: Michael Lanagan, Penn State University

2:00 PM Invited
High Temperature Capacitor Films: *Daniel Tan*[1]; Yang Cao[1]; Xiaomei Fang[1]; Patricia Irwin[1]; [1]GE

2:30 PM Invited
Barium Oxide Based Glasses for Dielectric Material: *Charles Stutz*[1]; Chad Holbrook[1]; Shibalik Chakraborty[2]; Sriram Ravindren[2]; Punit Boolchand[2]; Jonathan Goldstein[1]; [1]US Air Force; [2]University of Cincinnati

3:00 PM
Characterization of Degradation for MLCC under Thermal and Electrical Load Using DLTS Method: *Takafumi Okamoto*[1]; Noriyuki Inoue[1]; Clive Randall[2]; [1]Murata Mfg. Co., Ltd.; [2]The Pennsylvania State University

3:20 PM
Investigation of Low Oxygen Partial Pressure Processing of Alkali Niobate Perovskite: *Hiroyuki Shimizu*[1]; Keisuke Kobayashi[2]; Yutaka Doshida[2]; Youichi Mizuno[2]; Clive A. Randall[3]; [1]Taiyo Yuden Co., Ltd./PennState; [2]Taiyo Yuden Co., Ltd.; [3]PennState

3:40 PM Break

4:00 PM Invited
Capacitor Development for Reliable High Temperature Operation in Inverter Applications: Harlan Brown-Shaklee[1]; *Geoff Brennecka*[1]; Natthaphon Raengthon[2]; David Cann[2]; Stan Atcitty[1]; [1]Sandia National Laboratories; [2]Oregon State University

4:30 PM Invited
High-dielectric Constant, High-Temperature Ceramic Capacitors for Power Inverters: *U. (Balu) Balachandran*[1]; Manoj Narayanan[1]; Zhongqiang Hu[1]; Chan Park[1]; Tae Lee[1]; Stephen Dorris[1]; Beihai Ma[1]; [1]Argonne National Laboratory

5:00 PM
Strongly Dipolar Polythiourea, Polyurea Dielectrics with High Electrical Breakdown, Low Loss, and High Electrical Energy Density: *Shan Wu*[1]; Minren Lin[1]; Qiming Zhang[1]; [1]The Penn State University

5:20 PM
Self Healing Thin Film Electrodes for Increased Electrical Component Reliability: *Betul Akkopru Akgun*[1]; [1]The Pennsylvania State University

Advanced Materials in Dental and Orthopedic Applications — Next Generation Biomaterials for Prosthodontics and Orthopedics

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Tolou Shokuhfar, Michigan Technological University; Terry Lowe, Colorado School of Mines; Hanson Fong, University of Washington; Mathew Mathew, Rush University Medical Center; Cortino Sukotjo, University of Illinois at Chicago

Monday PM
February 17, 2014
Room: 32B
Location: San Diego Convention Center

Session Chairs: Terry Lowe, Manhattan Scientifics Inc. Company; Tolou Shokuhfar, Michigan Technological University

2:00 PM Invited
From Nanotechnology To Picotechnology: Revolutionizing Medicine: Thomas Webster[1]; [1]Northeastern University

2:30 PM Invited
Endurance of Low-modulus Beta-type Titanium Alloys for Spinal Fixation: *Mitsuo Niinomi*[1]; Masaaki Nakai[1]; Junko Hieda[1]; Ken Cho[1]; Kengo Narita[1]; [1]Tohoku University

3:00 PM
"Changing Landscape Coatings" for Bone Fixation Implants: Greg Nelson[1]; *John Nychka*[1]; Andre McDonald[1]; [1]University of Alberta

3:20 PM Break

3:40 PM Invited
Multifunctional Nanostructured Orthopedic Implant Surfaces - Characteristics and Fabrication Processes: *Craig Friedrich*[1]; [1]Michigan Technological University

4:10 PM
Ti-Nb-based Metastable Materials with Improved Biomechanical Properties: *Mariana Calin*[1]; Matthias Bönisch[1]; Arne Helth[1]; Ksenia Zhuravleva[1]; Jose Julio Gutiérrez Moreno[2]; Christina Lekka[2]; Annett Gebert[1]; Jürgen Eckert[1]; [1]IFW Dresden; [2]University of Ioannina

4:30 PM
Next Generation Surface Modification of Ni-Ti Alloys for Stent Application after Magnetoelectropolishing: *Puneet Gill*[1]; Vishal Musaramthota[1]; Norman Munroe[1]; Waseem Haider[2]; Amit Datye[3]; Rupak Dua[1]; Ryszard Rokicki[4]; Anthony McGoron[1]; [1]Florida International University; [2]University of Texas; [3]The University of Tennessee; [4]Electrobright

4:50 PM
Design Strategy for Biodegradable Mg-based Alloys for Medical Applications: *Yongjun Chen*[1]; Zhigang Xu[1]; Christopher Smith[1]; Jag Sankar[1]; [1]Department of Mechanical Engineering, North Carolina Agricultural & Technical State University

5:10 PM
Fabrication of TiO2 Nanotube Arrays Using 1,2-Propanediol Electrolyte for Application in Biomedical Implants.: *Debmalya Ganguly*[1]; Yu Zhao[1]; [1]Michigan Technological University

Advances in Surface Engineering: Alloyed and Composite Coatings III — Laser Processing, Thermal Spraying, and Friction Stir Processing of Coatings

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee
Program Organizers: Sandip Harimkar, Oklahoma State University; Jeff De Hosson, Univ of Groningen; Roger Narayan, University of North Carolina and North Carolina State University; Efstathios (Stathis) Meletis, University of Texas at Arlington; Virendra Singh, Schlumberger Rosharon Campus; Srinivasa Bakshi, Indian Institute of Technology-Madras; Mathieu Brochu, McGill University; Arvind Agarwal, Florida International University; Jian Luo, UC San Diego; Nancy Michael, University of Texas at Arlington; Nuggehalli Ravindra, New Jersey Institute of Technology; Adele Carradò, IPCMS; Choong-un Kim, University of Texas at Arlington; Amit Pandey, Rolls Royce LG Fuel Cell

Monday PM
February 17, 2014
Room: 1B
Location: San Diego Convention Center

Session Chairs: Srinivasa Bakshi, Indian Institute of Technology-Madras; Mathieu Brochu, McGill University

2:00 PM Invited
Use of Two Photon Polymerization to Create Microscale and Nanoscale Features: *R. Narayan*[1]; [1]UNC/NCSU Joint Department of Biomedical Engineering

2:20 PM Invited
Fiber Laser Cladding of Spherotene Spherical Fused WC/Inconel 625 Metal Matrix Composite (MMC) Coatings: *Jianyin Chen*[1]; Lijue Xue[1]; [1]National Research Council Canada

2:40 PM
Laser Surface Hardening of Fe-based Bulk Amorphous Alloys: Ashish Singh[1]; Farhadul Haque[1]; Shravan Katakam[2]; Narendra Dahotre[2]; *Sandip Harimkar*[1]; [1]Oklahoma State University; [2]University of North Texas

2:55 PM
Fabrication of Surface Composite via Additive Friction Stir Technology: Kumar Kandasamy[1]; Jacob Calvert[1]; Liam Renaghan[1]; Kevin Creehan[1]; *Jeffrey Schultz*[1]; [1]Aeroprobe Corporation

3:10 PM
Prediction of Intermetallics Evolved during Laser Surface Alloying of Molybdenum on Aluminum: Experimental & Theoretical Approach: *Ravi Rajamure*[1]; Hitesh Vora[1]; Srinivasan Srivilliputhur[1]; Narendra Dahotre[1]; [1]University of North Texas

3:25 PM
New Developments in High Velocity Air-fuel Spraying: *Andrew Verstak*[1]; [1]Kermetico inc.

3:40 PM Break

3:50 PM
Development of Solvothermally Densified Thermal Sprayed Coatings for Waste Incinerator Plants: *Patrick Masset*[1]; Sebastian Schuster[1]; Thomas Fehr[2]; [1]Fraunhofer UMSICHT; [2]Dept. für Geo- & Umweltwissenschaften

4:05 PM
Improvement of Arbide Type Refractories Using Thermal Plasma Treatments: *Aleksandar Mitrasinovic*[1]; Larry Pershin[1]; Javad Mostaghimi[1]; [1]University of Toronto

4:20 PM
Nanostructured Plasma Sprayed 6061Al-SiC Composite Coatings: *Satish Tailor*[1]; V. K. Sharma Sharma[1]; R. M. Mohanty[2]; P. R. Soni[1]; [1]Malaviya National Institute of Technology Jaipur; [2]Council of Scientific and Industrial Research

4:35 PM
Texturing of Steel Surfaces by Friction Stir Processing: *Dulce Rodrigues*[1]; Inês Costa[1]; [1]CEMUC-University of Coimbra

4:50 PM
Oxide Based Thermal Sprayed Coatings for Metal Dusting Applications: Patrick Masset[1]; *Eva Drechsler*[1]; Christoph Weih[1]; [1]Fraunhofer UMSICHT

Algorithm Development in Computational Materials Science and Engineering — Algorithms for Lower Length Scale Modeling: Ab Initio, Atomistics and Materials Chemistry: Part II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee
Program Organizers: Jonathan Zimmerman, Sandia National Laboratories; Douglas Spearot, University of Arkansas; Adrian Sabau, Oak Ridge National Laboratory; Mark Tschopp, Army Research Laboratory; Mohsen Asle Zaeem, Missouri University of Science and Technology

Monday PM
February 17, 2014
Room: 31B
Location: San Diego Convention Center

Session Chairs: Adrian Sabau, Oak Ridge National Laboratory; Mark Tschopp, U.S. Army Research Laboratory

2:00 PM Invited
Structure Identification, Quantification and Visualization for Atomistic Simulations: *Alexander Stukowski*[1]; [1]Darmstadt University of Technology

2:40 PM
The Elastic-plastic Decomposition of the Atomistic Stress Tensor: *Nikhil Chandra Admal*[1]; Ellad Tadmor[1]; [1]University of Minnesota

3:00 PM
A Kinetic Monte Carlo Model for Material Aging: Simulations of Second Phase Formation at Au/Bi_2Te_3 Junction in Oxygen Environments: *Xiaowang Zhou*[1]; Nancy Yang[1]; [1]Sandia National Laboratories

3:20 PM
Green's Function Methods for Monte Carlo Simulations of Materials on Extended Time Scales: *Vasily Bulatov*[1]; [1]LLNL

3:40 PM Break

4:00 PM
Implementation and Validation of a Multiphase Multigrain Model of Equiaxed Solidification: *Marcelo Martorano*[1]; Juan Arango[1]; Franco Ramunno[1]; [1]University of São Paulo

4:20 PM
Numerical Simulation of Macrosegregation with Multiphase Model and Non-orthogonal Grids: *Wutao Tu*[1]; Wensheng Li[2]; Houfa Shen[1]; Baicheng Liu[1]; [1]Tsinghua University; [2]Electric Power Research Institute of Guangdong Power Grid Corporation

4:40 PM
Parallel-tempering Implementation of Grand-canonical Monte Carlo Simulation for Solids: *Tongsik Lee*[1]; Michael Baskes[1]; Christopher Taylor[1]; Michael Demkowicz[2]; [1]Los Alamos National Laboratory; [2]Massachusetts Institute of Technology

Alumina and Bauxite — Bayer Process/Quality

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Ian Duncan, Hatch Ltd

Monday PM
February 17, 2014
Room: 15B
Location: San Diego Convention Center

Session Chair: Stephen Lindsay, Alcoa

2:00 PM Introductory Comments

2:05 PM
Evolution of the Technology for the Production of Alumina from Bauxites: Viktor Medvedev[1]; Serguey Akhmedov[1]; [1]ALCORUS Co Ltd

2:30 PM
Approaches to the Processing of Jamaican Bauxite with High Aluminous Goethite Content: *Desmond Lawson*[1]; Ab Rijkeboer[2]; Horace Lawrence[1]; Dejan Dajkovic[1]; Marvin Jackson[2]; [1]est Indies Alumina Co; [2]Rinalco B.V

2:55 PM
Improvement of Processing Characteristics of High Carbonate and High Silica Diasporic Bauxite by Enriching Roasting: *Andrey Panov*[1]; Alexander Suss[1]; Irina Paromova[1]; Alexander Fedyaev[1]; [1]RUSAL Engineering & Technology Centre

3:20 PM
New High Performance Crystal Growth Modifiers to Improve Alumina Trihydrate Quality and Yield: Ryan Chester[1]; John Kildea[1]; *Everett Phillips*[2]; [1]Nalco Australia Pty Ltd; [2]Nalco Company

Aluminum Alloys: Development, Characterization and Applications — Development and Application

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Xiyu Wen, University of Kentucky

Monday PM
February 17, 2014

Room: 12
Location: San Diego Convention Center

Session Chair: Zhengdong (Steven) Long, Kaiser Aluminum

2:00 PM Invited
Aluminum Alloys and Manufacturing Processes for Automotive Structural Applications: *Alan Luo*[1]; [1]The Ohio State University

2:20 PM
AMAG 6XXX Series Alloys for Chassis Application in the Automotive Industry: *Josef Berneder*[1]; Ramona Prillhofer[1]; Josef Enser[1]; Torsten Grohmann[1]; [1]AMAG Rolling

2:40 PM
Unusual Nanostructures in a Rapidly-solidified Aluminum Alloy for Advanced Energy Applications: *Manuel Marya*[1]; Indranil Roy[1]; [1]Schlumberger Technology Corporation

3:00 PM
Friction Stir Welding of Al-Cu-Li-Mg-Ag (2098), Al-Cu-Li-Mg-Zn (2199) and Al-Mg-Li (1424): A Comparative Study of Resulting Microstructure and Mechanical Property: *Harpreet Sidhar*[1]; Rajiv Mishra[1]; Anthony Reynolds[2]; John Baumann[3]; Juergen Silvanus[4]; [1]University of North Texas; [2]University of South Carolina; [3]The Boeing Company; [4]EADS Innovation Works Germany

3:20 PM
Heat Treating of High Pressure Die Castings; Challenges and Possibilities: *Salem Seifeddine*[1]; Darya Poletaeva[2]; Mohammad Ghorbani[2]; Anders Jarfors[2]; [1]Swerea SWECAST; [2]School of Engineering, Jönköping University

3:40 PM Break

3:55 PM
Influence of the Chemical Composition on the Ductility of an AlSiCuZnFe Recycling Foundry Alloy: *Philip Pucher*[1]; Holm Böttcher[1]; Helmut Antrekowitsch[2]; Peter Uggowitzer[3]; Helmut Kaufmann[4]; [1]AMAG CASTING; [2]University of Leoben; [3]ETH Zurich; [4]AMAG AG

4:15 PM
Assessment of Hot Cracking during TIG Welding of B206 Aluminum Alloy: *Francesco D'Elia*[1]; Anthony Lombardi[1]; Comondore (Ravi) Ravindran[1]; Dimitry Sediako[2]; K. Prasad Rao[3]; [1]Ryerson University; [2]Canadian Neutron Beam Centre - National Research Council of Canada; [3]Indian Institute of Technology Madras

4:35 PM
Influence of Microstructure on the Folding Behavior of Crash Relevant Aluminum Extrusion Parts: *Marcel Rosefort*[1]; Ruven Baumgart[1]; Christiane Matthies[1]; Hubert Koch[1]; [1]TRIMET Aluminium SE

4:55 PM
Effect of TiC Powder Addition on the Grain Refinement Response of B319 Aluminium Alloy: *Vishank Kumar*[1]; Lukas Bichler[1]; [1]University of British Columbia, Canada

5:15 PM
Properties of AlZn10Si8Mg Alloys for High Performances Application: *Mario Rosso*[1]; [1]POLITECNICO di Torino

Aluminum Processing — Aluminum Processing: Rolling & Twin-Roll Casting

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Kai Karhausen, Hydro Aluminium Rolled Products GmbH

Monday PM
February 17, 2014

Room: 13
Location: San Diego Convention Center

Session Chair: To Be Announced

2:00 PM Introductory Comments

2:05 PM Invited
Towards Real-time Physics-based Simulation of Al Sheet Processing: *Günter Gottstein*[1]; Markus Kuehbach[1]; Luis Barrales-Mora[1]; [1]RWTH Aachen University

2:25 PM
Comparison of Texture Prediction in Cold Rolling of Aluminum with VPSC, CP-FEM and GIA: *Stephan Hojda*[1]; Markus Bambach[1]; Stephan Heppner[1]; [1]Institute of Metal Forming

2:45 PM
Evolution of Microstructure and Texture during Severe Cold Rolling and Annealing of Al-2.5%Mg and Al-2.5%Mg-0.2%Sc Alloys: *Jagga Gatti*[1]; Pinaki Bhattacharjee[1]; [1]Indian Institute of Technology Hyderabad

3:05 PM
Dynamic Simulation of Internal Logistics in Aluminum Downstream Manufacturing: *Anton Winkelmann*[1]; Sverre Brandal[2]; Stefan Neumann[3]; Juliens Desjardins[4]; [1]Hydro Aluminium Deutschland GmbH; [2]Hydro Aluminium AS; [3]Hydro Aluminium Rolled Products; [4]Idecraft

3:25 PM Break

3:40 PM
Study of Wire Fabrication of Aluminum Treated with Diboride Particles: *Alexandra Padilla*[1]; Raul Marrero[1]; David Florian[1]; Marcelo Suarez[1]; [1]University of Puerto Rico, Mayagüez Campus

4:00 PM
Influence of the Twin-roll Casting Parameters on the Microsegregation in Thin Strips of the Aluminium Alloy EN AW-6082: *Olexandr Grydin*[1]; Mykhailo Stolbchenko[2]; Florian Nürnberger[1]; Mirko Schaper[2]; [1]Leibniz Universität Hannover; [2]Universität Paderborn

4:20 PM
Determination of Aluminum Rolling Oil and Machinery Oil Residues on Aluminum Sheet and Foil by Using Elemental Analysis and Fourier Transform Infrared Spectroscopy Coupled with Multivariate Calibration: Özlem Inanç Uçar[1]; *Hatice Mollaoglu Altuner*[1]; Mert Günyüz[1]; Mustafa Murat Dündar[1]; Durmus Özdemir[1]; [1]Assan Alüminyum

4:40 PM
Flow Behaviour and Constitutive Modelling of Aluminium Alloy Sheet for Hot Blank-cold Die (HB-CD) Forming: *Fadi Abu-Farha*[1]; [1]Clemson University

5:00 PM
Analysis of Interdendritic Strain during Dendritic Solidification in Twin-roll Strip Casting of Aluminum Alloys: *Mostafa ElBealy*[1]; [1]Company Chair of JK

Aluminum Reduction Technology — Cell Design and Performance

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Margaret Hyland, University of Auckland

Monday PM
February 17, 2014
Room: 14B
Location: San Diego Convention Center

Session Chair: Pascal Lavoie, Light Metals Research Centre

2:00 PM Introductory Comments

2:05 PM
Preparation and Start-Up of Arvida Smelter, AP60 Technological Center: *René Gariepy*[1]; André Couturier[1]; Olivier Martin[1]; Bertrand Allano[1]; André Machado[1]; François Charmier[1]; [1]Rio Tinto Alcan

2:30 PM
Industrial Running of the 530kA Potline in North-western China: *Xiping Chen*[1]; Xuemin Liang[2]; [1]Zhengzhou Research Institute of Chalco; [2]Central South University Institute Co. Ltd

2:55 PM
The End of an Era for Søderberg Technology in North and South America: *Michael Barber*[1]; Alton Tabereaux[1]; [1]Consultant

3:20 PM
Successful Startup of World Largest Greenfield Smelter: *Raja Javed Akhtar*[1]; Salman Abdulla[1]; Mohammed Al Qassemi[1]; [1]Emirates Aluminium Company (Emal)

Aluminum Reduction Technology — Potline Operations - Cell Operations

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Margaret Hyland, University of Auckland

Monday PM
February 17, 2014
Room: 14A
Location: San Diego Convention Center

Session Chair: Olivier Martin, Rio Tinto Alcan

2:00 PM Introductory Comments

2:05 PM
Cell Electrical Preheating Practices at DUBAL: Michel Reverdy[1]; *Abdulla Zarouni*[1]; Rawa Ba Raheem[1]; Ali Al Zarouni[1]; Nadia Ahli[1]; Mahasal Khan[1]; Mohamed Tawfik[1]; Maryam Al Jallaf[1]; Ibrahim Baggash[1]; Kamel Alaswad[1]; Sergey Akhmetov[1]; Abdulla Al Jaziri[1]; Vinko Potocnik[2]; Alexander Arkhipov[1]; [1]DUBAL; [2]Vinko Potocnik Consultant Inc.

2:30 PM
DUBAL Cell Voltage Drop Initiatives Towards Low Energy High Amperage Cells: Michel Reverdy[1]; *Abdulla Zarouni*[1]; Bernard Jonqua[1]; Nadia Ahli[1]; Ali Al Zarouni[1]; Lalit Mishra[1]; Marwan Bastaki[1]; Amal Al Jasmi[1]; Vinko Potocnik[1]; [1]DUBAL

2:55 PM
Start up of the Shut Down Pots - Problems and Solutions to Improve the Results: *Diego Marinho*[1]; [1]Votorantim Metais CBA

3:20 PM
Thermal Events of the Early Life of an Aluminium Electrolysis Cell: *Adam Ugron*[1]; Laszlo Kiss[1]; Sebastien Guerard[2]; Jean-Francois Bilodeau[2]; [1]UQAC/GRIPS; [2]RTA/CRDA

3:45 PM Break

4:00 PM
Regulation System to Improve Quality of the Metal Sucked during Tapping Operation: *Anne-Gaëlle Hequet*[1]; [1]ECL

4:25 PM
Key Success Factors Deploying a Manufacturing Excellence Solution(MESAL™) in Rio Tinto Alcan: *Manuel Chareyre*[1]; Steve Boivin[2]; [1]Rio Tinto Alcan – Smelter Technology (AP); [2]Rio Tinto Alcan - IS&T

Biological Materials Science Symposium — Mechanical Behavior of Biological Materials II: Natural Materials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Po-Yu Chen, National Tsing Hua University; Rajendra Kasinath, Johnson and Johnson Company; Dwayne Arola, University of Washington; Kalpana Katti, North Dakota State University

Monday PM
February 17, 2014
Room: 33A
Location: San Diego Convention Center

Session Chairs: Francois Barthelat, McGill University; Dwayne Arola, University of Maryland Baltimore County

2:00 PM Invited
Flexible Dermal Armor: Perspectives for Bioinspired Designs: *Marc Meyers*[1]; Robert Ritchie[2]; Wen Yang[1]; Bernd Gludovatz[3]; Elizabeth Zimmermann[3]; Irene Chen[1]; [1]UCSD; [2]LBL/UCBerkeley; [3]Lawrence Berkely Lab.

2:30 PM
Flexible Dermal Armor: Biodesigns Learned from Nature: *Irene Chen*[1]; Wen Yang[1]; Marc Meyers[1]; [1]UC San Diego

2:50 PM
An Alternate Approach for Characterizing the Fracture Resistance of Cycloid Fish Scales: *Sandra Murcia*[1]; Edgar Ossa[2]; Dwayne Arola[1]; [1]UMBC; [2]Universidad Eafit

3:10 PM
Protective Role of Arapaima Scales: Structure and Mechanical Behavior: *Vincent Sherman*[1]; Wen Yang[1]; Bernd Gludovatz[2]; Elizabeth A. Zimmermann[3]; Eric Schaible[4]; Zhao Qin[5]; M. J. Buehler[5]; Robert O. Ritchie[6]; Marc A. Meyers[1]; [1]Materials Science and Engineering Program, University of California, San Diego; [2]Materials Sciences Division, Lawrence Berkeley National Laboratory; [3]Department of Osteology and Biomechanics (IOBM), University Medical Center Hamburg-Eppendorf; [4]Experimental Systems Group, Advanced Light Source, Lawrence Berkeley National Laboratory; [5]Department of Civil and Environmental Engineering, Massachusetts Institute of Technology; [6]Department of Materials Science and Engineering, University of California, Berkeley

3:30 PM Break

3:40 PM Invited
Overcoming the Brittleness of Glass through Bio-inspiration and Microarchitecture: Mohammad Seyed Mirkhalaf[1]; Ahmad Khayer Dastjerdi[1]; *Francois Barthelat*[1]; [1]McGill University

4:10 PM
Multiscale Structural and Mechanics Study of the Red-bellied Woodpecker Beak: *Nayeon Lee*[1]; M Horstemeyer[1]; Hongjoo Rhee[1]; Jun Liao[1]; Lakiesha Williams[1]; [1]Mississippi State University

4:30 PM
Bioinspired Grippers Based on the Seahorse Tail: *Michael Porter*[1]; Tomas Praet[2]; Anabela Maia[2]; Shengqiang Cai[1]; Benedict Verhegghe[2]; Dominique Adriaens[2]; Marc Meyers[1]; Joanna McKittrick[1]; [1]University of California, San Diego; [2]Ghent University

4:50 PM
Roles of Collagen Fibrils on the Mechanical Properties of Skin: Wen Yang[1]; Vincent Sherman[1]; Bernd Gludovatz[2]; Elizabeth Zimmermannc[3]; Eric Schaible[2]; Polite Stewart[2]; Robert Ritchie[4]; *Marc Meyers*[1]; [1]University of California, San Diego; [2]Lawrence Berkeley National Laboratory; [3]University Medical Center Hamburg-Eppendorf; [4]University of California, Berkeley

5:10 PM
A Physics-based Model for Mechanical Deformation in Nacre: Sina Askarinejad[1]; *Nima Rahbar*[1]; [1]Worcester Polytechnic Institute

Bulk Metallic Glasses XI — Structures and Mechanical Properties I

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; H. Choo, University of Tennessee; Y. Gao, University of Tennessee; Y. F. Shi, Rensselaer Polytechnic Institute

Monday PM — Room: 2
February 17, 2014 — Location: San Diego Convention Center

Session Chairs: John Lewandowski, Case Western Reserve University; Ken Kelton, Washington University

2:00 PM Invited
Ductilization of Metallic Glasses by Mechanical Treatment: *Jurgen Eckert*[1]; Sergio Scudino[1]; Denise Beitelschmidt[1]; Hamed Shakur Shahabi[1]; Uta Kuehn[1]; Mihai Stoica[1]; [1]IFW Dresden

2:20 PM
Changes in Microstructure of Zr-Based Bulk Metallic Glass Composites as a Function of Deformation Temperature: *Jessica Booth*[1]; John Lewandowski[1]; Jennifer Carter[1]; [1]Case Western Reserve University

2:30 PM Invited
Fracture Toughness, Flaw Sensitivity, and Engineering Applicability of Ferrous-metal Glasses: *Marios Demetriou*[1]; Bernd Gludovatz[2]; Jong-Hyun Na[3]; Glenn Garrett[3]; Robert Ritchie[2]; William Johnson[1]; [1]California Institute of Technology; [2]Lawrence Berkeley National Laboratory; [3]Glassimetal Technology

2:50 PM
Characterizing Spatial Variations in the Mechanical Properties of Metallic Glass Matrix Composites Using Nanoindentation: *Kelly Kranjc*[1]; Douglas Hofmann[2]; Allen Hunter[3]; Emmanuelle Marquis[3]; Wolfgang Windl[4]; Katharine Flores[1]; [1]Washington University; [2]NASA Jet Propulsion Laboratory; [3]University of Michigan; [4]Ohio State University

3:00 PM Invited
Flow, Fracture, and Fatigue Studies on Bulk Metallic Glasses: *John Lewandowski*[1]; [1]Case Western Reserve University

3:20 PM
Controlled Crystallization Behaviour of Metallic Glass Forming Alloys Measured by Electrostatic Levitation: *Chae Woo Ryu*[1]; Eun Soo Park[1]; Dong Hee Kang[2]; Geun Woo Lee[2]; [1]Seoul National University; [2]Korea Research Institute of Standards and Science

3:30 PM Break

3:50 PM Invited
Nano-sized Metallic Glasses: A Suite of Unique Properties: *Julia Greer*[1]; Jan Rys[1]; Dongchan Jang[1]; David Chen[1]; [1]California Institute of Technology

4:10 PM
Micromechanical Behaviors of Fe Based Bulk Metallic Glass: *Thien Phan*[1]; Andrea Hodge[1]; Michael Kassner[1]; Olivia Graeve[2]; James Kelly[2]; [1]University of Southern California; [2]University of California, San Diego

4:20 PM Invited
A Bulk Metallic Glass with Record-breaking Damage Tolerance: *Evan Ma*[1]; [1]Johns Hopkins University

4:40 PM
Catalytic Behavior of PdSiCu Metallic Glass in Bulk and Thin Film Forms: *Yiyi Yang*[1]; Sharvan Kumar[1]; [1]Brown University

4:50 PM Invited
Relation between Fragility and the Rate of Structural Ordering in Supercooled Liquids: *Ken Kelton*[1]; Nicholas Mauro[1]; Matthew Blodgett[1]; Mark Johnson[1]; Adam Vogt[1]; [1]Washington University

5:10 PM
Effect of Severe Plastic Deformation on Mechanical Property and Relaxation Behavior of $Zr_{50}Cu_{40}Al_{10}$ Bulk Metallic Glass: *Nozomu Adachi*[1]; Yoshikazu Todaka[1]; Kazuya Shintani[1]; Minoru Umemoto[1]; Yoshihiko Yokoyama[2]; [1]Toyohashi University of Technology; [2]Institute for Materials Research, Tohoku University

5:20 PM Invited
Mechanical Properties of a Shear-band in a Metallic Glass: *Robert Maass*[1]; Matthias Buechsenschuetz-Goebler[1]; Hai-Bin Yu[1]; Walter Arnold[2]; Konrad Samwer[1]; Cynthia Volkert[1]; [1]Georg-August Universität Göttingen; [2]Saarland University

Cast Shop for Aluminum Production — Macrosegregation and DC Casting

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Edward Williams, Alcoa

Monday PM — Room: 15A
February 17, 2014 — Location: San Diego Convention Center

Session Chair: J. Lee Davis

2:00 PM Introductory Comments

2:05 PM
Mechanisms and Control of Macrosegregation in DC Casting: *Dmitry Eskin*[1]; [1]Brunel University

2:35 PM
Modelling of Micro- and Macrosegregation in Multicomponent Aluminium Alloys Accounting for Secondary Phase Formation: *Kjerstin Ellingsen*[1]; [1]SINTEF

3:00 PM
Macrosegregation Modelling of DC-casting Including Grain Motion and Surface Exudation: *Dag Mortensen*[1]; Mohammed M'Hamdi[2]; Kjerstin Ellingsen[2]; Knut Tveito[3]; Liss Pedersen[4]; Geir Grasmo[4]; [1]Institute for Energy Technology; [2]SINTEF Materials and Chemistry; [3]Norwegian University of Science and Technology; [4]Alcoa Norway

3:25 PM
A New DC Casting Technology for Extrusion Billets with Improved Surface Quality: *Arild Hakonsen*[1]; John Hafsås Hafsås[2]; Rune Ledal[1]; [1]Hycast AS; [2]Hydro Aluminium

3:50 PM Break

4:05 PM
An Innovative Automated Surface Inspection of DC Cast Billets: *Philippe Martin*[1]; Roch Larouche[2]; Jean-Alain Laurin[1]; [1]Rio Tinto Alcan; [2]NYX Dimensions Inc.

4:30 PM
Impact of Cooling Water Composition on Heat Transfer in Ingot Casting: *David Gildemeister*[1]; [1]Alcoa Technical Center

4:55 PM
Neutron Diffraction Measurements of As-cast Residual Stresses in AA7050 Rolling Plate Ingots: Influence of a Wiper: *Jean-Marie Drezet*[1]; Pierre Celle[2]; Olivier Ribaud[3]; Thilo Pirling[4]; [1]Ecole Polytechnique Federale Lausanne; [2]Constellium, Centre de Recherches de Voreppe (CRV) ; [3]Constellium, Centre de Recherches de Voreppe (CRV); [4]Institut Laue Langevin

Celebrating the Megascale: An EPD Symposium in Honor of David G.C.Robertson — Ferro-Alloys

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee
Program Organizers: Phillip Mackey, P.J. Mackey Technology; Rodney Jones, Mintek; Eric Grimsey, Curtin University, W A School of Mines; Geoffrey Brooks, Swinburne University of Technology

Monday PM
February 17, 2014
Room: 16A
Location: San Diego Convention Center

Session Chairs: Rodney Jones, Mintek; Lloyd Nelson, Anglo American Platinum Limited

2:00 PM Introductory Comments

2:05 PM Invited
Developments in Manganese Ferroalloy Research and Production in the Last 25 Years: *Merete Tangstad*[1]; Ragnar Tronstad[2]; [1]NTNU; [2]Elkem Solar

2:25 PM Invited
DC Arc Furnaces - Past, Present, and Future: *Rodney Jones*[1]; [1]Mintek

2:45 PM
Recent Developments in FactSage Thermochemical Software and Databases: *Christopher Bale*[1]; [1]CRCT - Center for Research in Computational Thermochemistry

3:05 PM Invited
Reduction of Agglomerated Manganese Ores in a 150kW Pilot Scale Furnace: *Thomas Brynjulfsen*[1]; Merete Tangstad[1]; [1]Norwegian University of Science and Technology

3:25 PM Break

3:45 PM
Arc Detection in DC Arc Furnaces: *Quinn Reynolds*[1]; [1]Mintek

4:05 PM
An Electromagnetically Stirred Slurry Model for the Smelting Zone of a Ferroalloy Furnace: *Ben Bowman*[1]; [1]Consultant

4:25 PM
Technical Aspects of Large-scale Ferro-alloy Electric Furnace Smelting: *Lloyd Nelson*[1]; [1]Anglo American Platinum Ltd

4:45 PM
Role of Mn Carbides in Carbothermic Processes of Mn Alloys: Byeong Lee[1]; H.K. Shin[1]; *Young Lee*[1]; [1]Dongbu Metal Company

Characterization of Minerals, Metals and Materials 2014 — Characterization of Composites

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee
Program Organizers: John Carpenter, Los Alamos National Laboratory; Chen-Guang Bai, Chongqing University; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Monteiro, State University of North Rio de Janeiro; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal Global R&D

Monday PM
February 17, 2014
Room: 7A
Location: San Diego Convention Center

Session Chairs: Florence Vivier, ITT; Priscila Alves Martins, LAREX-POLI-USP

2:00 PM
Microstructural Characterization of Eroded M26 HET Thruster Wall: *Thomas Burton*[1]; Gregory Thompson[1]; Aaron Schinder[2]; German Capuano[2]; Julian Rimoli[2]; Mitchell Walker[2]; [1]University of Alabama; [2]Georgia Institute of Technology

2:20 PM
A Kinetic Analysis of a Thermal Curing Reaction of a Silicon Resin in Solid State: *Florence Vivier*[1]; Diego Santamaria[2]; Diego Pellerej[2]; Pietro Buonfico[2]; Marco Sangermano[3]; [1]ITT ; [2]ITT; [3]Politecnico di Torino

2:40 PM
Biodegradable Flexible Films Based on Copolyester Reinforced with Organophilic Clay: *Edinaldo Severino*[1]; Vijaya Rangari[2]; Valquiria Silva[1]; Michelle Gomes[1]; Esperidiana Moura[1]; Francisco Valenzuela Díaz[3]; [1]Instituto de Pesquisas Energéticas e Nucleares – IPEN-CNEN/SP; [2]Tuskegee University; [3]Universidade de São Paulo, Escola Politécnica

3:00 PM
Effects of Green Calcium Carbonate Addition on Mechanical and Morphological Properties of Flexible Films Based on Biodegradable Polymer: Alexandra Silva[1]; Valquiria Silva[1]; Vijaya Rangari[2]; Shaik Jeelani[3]; Rene Oliveira[1]; Francisco Valenzuela-Díaz[4]; *Esperidiana Moura*[1]; [1]Instituto de Presquisas Energeticas e Nucleares-IPEN-CNEN/SP; [2]Department of Materials Science and Engineering, Tuskegee University,; [3]Department of Materials Science and Engineering, Tuskegee University,; [4]Metallurgical and Materials Engineering Department, Polytechinic School,University of São Paulo

3:20 PM
Halogen Free Flame Retardant for ABS Composite with Oxide Nanoparticles: *Priscila Martins*[1]; Ticiane Valera[1]; Julio Bartoli[2]; Jorge Tenório[1]; [1]LAREX- POLI - USP; [2]Unicamp

3:40 PM Break

3:50 PM
Investigation on the Thermal Conductivity of Resin Composite Materials: *Kenji Monden*[1]; [1]Denki Kagaku Kogyo K.K.

4:10 PM
Obtention and Characterization of Nanocomposites Based on Copolyester Starch Biodegradable Blend and Brazilian Organophilic Clay: *Rosangela Accioli*[1]; Vijaya Rangari[2]; Esperidiana Moura[1]; Francisco Valenzuela Díaz[3]; [1]Instituto de Pesquisas Energéticas e Nucleares; [2]Tuskegee University; [3]Universidade de São Paulo, Escola Politécnica

4:30 PM
Polypropylene Nanocomposites Reinforced with Organophilic Clay and Brazilian Nut Fibers: Francisco Valenzuela-Diaz[1]; *Leila Gomes*[1]; Danilo Fermino[1]; Maria das Gracas Valenzuela[1]; Esperidiana Moura[2]; [1]Universidade de Sao Paulo; [2]Nuclear and Energy Research Institute, IPEN-CNEN/SP

4:50 PM
Interfacial Evolution of Al/Cu Laminated Composite Produced by Asymmetrical Roll Bonding and Annealing: *Xiaobing Li*[1]; Guoyin Zu[1]; Ping Wang[1]; [1]School of Materials and Metallurgy, Northeastern University

5:10 PM
Forging Hot and Cold: Development Through the Ages: *Hugh McQueen*[1]; Enrico Evangelista[2]; [1]Concordia University; [2]University of Ancona

Computational Modeling and Simulation of Advanced Materials for Energy Applications — Quantum to Atomistic Simulations

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee
Program Organizers: Lan Li, Boise State University; Laura Bartolo, Kent State University; Cong Wang, Northwestern University; Chandler Becker, NIST

Monday PM
February 17, 2014
Room: Mission Hills
Location: San Diego Marriott Marquis & Marina

Session Chair: Chandler Becker, National Institute of Standards and Technology

2:00 PM Invited
Computational Design of Complex Semiconductor Materials for Energy Application: *Stephan Lany*[1]; [1]NREL

2:30 PM
Electrical Properties of Point Defects in CdS and ZnS Thin-film PV Buffer Layers: *Vincenzo Lordi*[1]; Joel Varley[1]; [1]Lawrence Livermore National Lab

2:50 PM
A Molecular Dynamics Simulation Study of Alkylimidazolium Tetrafluoroborate Confined between the Graphene Electrode: *YounJoon Jung*[1]; Sungsik Ju[1]; Youngseon Shim[1]; [1]Seoul National University

3:10 PM Invited
The Kinetics of Ordering Phase Transformations in Ni-Cr Alloys: *Julie Tucker*[1]; Leland Barnard[2]; Dane Morgan[2]; George Young[1]; [1]Knolls Atomic Power Laboratory; [2]University of Wisconsin - Madison

3:40 PM Break

3:55 PM Invited
Nanoscale Metallic Foams, a New Class of Materials for ExtremEnvironments: *Alfredo Caro*[1]; [1]LANL

4:25 PM
Effect of the 3D Porous Structure on the Sintering of Ni Nanoparticles in the Ni/YSZ Anode: A Molecular Dynamics Simulation Study: *Jingxiang Xu*[1]; Yuji Higuchi[1]; Nobuki Ozawa[1]; Momoji Kubo[1]; [1]Fracture and Reliability Research Institute (FRRI), Graduate School of Engineering, Tohoku University, Japan

4:45 PM
A GPU-based Kinetic Monte Carlo Approach for the Evolution of Defects in Irradiated Materials: *Fernando Jiménez*[1]; Christophe Ortiz[1]; [1]CIEMAT

5:05 PM Invited
Atomistic Methods for the Investigation of Radiation Effects: *Roger Stoller*[1]; Haixuan Xu[1]; Yuri Osetskiy[1]; [1]Oak Ridge National Laboratory

Computational Thermodynamics and Kinetics — In Honor of Dr. Mark Asta, EMPMD Outstanding Scientist: Session II

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Long Qing Chen, Penn State University; Guang Sheng, Scientific Forming Technologies Corporation; Jeffrey Hoyt, McMaster University; Dallas Trinkle, University of Illinois at Urbana-Champaign

Monday PM
February 17, 2014
Room: 30D
Location: San Diego Convention Center

Session Chairs: Chris Wolverton, Northwestern University; Timofey Frolov, University of California, Berkeley

2:00 PM Invited
Prefreezing and Premelting at Solid-liquid Interfaces: *Brian Laird*[1]; Mark Asta[2]; Pablo Palafox-Hernandez[3]; Yang Yang[1]; [1]University of Kansas; [2]University of California, Berkeley; [3]Deakin University

2:30 PM Invited
Shear-coupled Grain-boundary Motion: Insights from Fluctuation Analysis and Atomistic-Scale Simulations: *Alain Karma*[1]; Ari Adland[1]; Yuri Mishin[2]; Zachary Trautt[3]; [1]Northeastern University; [2]George Mason University; [3]NIST

3:00 PM Invited
Temporal Evolution of the Gamma(fcc)/Gamma-prime(L12) Interfacial Widths in Binary Ni-Al Alloys: *David Seidman*[1]; Elizaveta Plotnikov[1]; Zugang Mao[1]; Ronald Noebe[2]; [1]Northwestern University; [2]NASA Glenn Research Center

3:30 PM Break

4:00 PM Invited
Role of the Solid-liquid Interface in the Brownian Motion of Pb Inclusions in Al: *Ulrich Dahmen*[1]; Tamara Radetic[2]; Erik Johnson[3]; David Olmsted[4]; Mark Asta[4]; [1]LBNL; [2]University of Belgrade; [3]University of Copenhagen; [4]UC Berkeley

4:30 PM Invited
Watching the Evolution of Highly Anisotropic Microstructures: Ashwin Shahani[1]; John Gibbs[1]; Begum Gulsoy[1]; Julie Fife[2]; *Peter Voorhees*[1]; [1]Northwestern University; [2]Paul Scherrer Institut

Deformation, Damage, and Fracture of Light Metals and Alloys III — Al Alloys

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Ke An, Oak Ridge National Laboratory; Qizhen Li, University of Nevada, Reno

Monday PM
February 17, 2014
Room: 19
Location: San Diego Convention Center

Session Chair: Ke An, Oak Ridge National Laboratory

2:00 PM
Characteristics of High Strain Rate Behavior in AA 2219-T87 and AA 2195-T87: *Taylor Murphy*[1]; J.A. Schneider[1]; H. Hamann[2]; P. Loewe[2]; P. Portella[2]; [1]Mississippi State University; [2]BAM

2:30 PM
Characterizing the Hemming Performance of Automotive Aluminum Alloys With High-resolution Topographic Imaging: *Mark Stoudt*[1]; Joseph Hubbard[1]; John Carsley[2]; Susan Hartfield-Wünsch[3]; [1]National Institute of Standards and Technology; [2]General Motors Research & Development; [3]General Motors Technical Center

2:50 PM
Multi-scale Full-field Optical Measurement of Crack Growth and Deformations in Fatigue of a Welded Aluminum Structure: *Olli Puustinen*[1]; Sven Bossuyt[1]; [1]Aalto University

3:10 PM
Analysis of the Microstructure and Properties of Friction Stir Weld Zones in the Al 2139-T8 Alloy: *Tomoko Sano*[1]; Uchechi Okeke[2]; Jian Yu[1]; Carl Boehlert[2]; Chian-Fong Yen[1]; [1]US Army Research Laboratory; [2]Michigan State University

3:30 PM Break

3:45 PM
Intra-granular Failure Mechanisms during Semi-solid Deformation of Al-Cu Microstructures Using 4D In Situ Synchrotron-based X-ray Tomographic Microscopy: *Shyamprasad Karagadde*[1]; Biao Cai[1]; Julie Fife[2]; Kristina Kareh[3]; Peter Lee[1]; [1]University of Manchester; [2]Paul Scherrer Institut; [3]Imperial College London

4:15 PM
Creep-fatigue Behavior of A356 Cast Aluminum Alloy: *Phalgun Nelaturu*[1]; Rajiv Mishra[1]; Glenn Grant[2]; Saumyadeep Jana[2]; Blair Carlson[3]; [1]University of North Texas; [2]Pacific Northwest National Laboratory; [3]General Motors R&D Center

4:35 PM
The Effect of Setting Velocity on the Static and Fatigue Strengths of Self-piercing Riveted Joints for Automotive Applications: *Dezhi Li*[1]; Li Han[2]; Andreas Chrysanthou[3]; Mike Shergold[2]; Geraint Williams[1]; [1]University of Warwick; [2]Jagular Land Rover; [3]University of Hertfordshire

Dynamic Behavior of Materials VI – An SMD Symposium in Honor of Professor Marc Meyers — High-Strain-Rate Effects in Heterogeneous Materials

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Naresh Thadhani, Georgia Institute of Technology; George Gray, Los Alamos National Laboratory

Monday PM
February 17, 2014
Room: 3
Location: San Diego Convention Center

Session Chairs: Larry Murr, University of Texas at El Paso; Lothar Meyer, Nordmetall GmbH

2:00 PM Keynote
The Magic of Deciphering High Strain-rate and High-pressure Properties of Elastomeric Composites, Using Low Frequency Measurements: *Sia Nemat-Nasser*[1]; [1]UC San Diego

2:30 PM Invited
The High-strain Rate Loading of Structural Biological Materials: *William Proud*[1]; Spyros Masouros[1]; Katherine Brown[2]; [1]Imperial College London; [2]University of Cambridge

2:50 PM Invited
On the Modeling of the Dynamic Behavior of Polymers and Polymer Composites: *Said Ahzi*[1]; [1]University of Strasbourg

3:10 PM
Insights Into the Effects of Tensile and Compressive Loadings on Microstructure Dependent Fracture of Trabecular Bone: *Vikas Tomar*[1]; [1]Purdue University

3:30 PM Break

3:50 PM Invited
Dynamic Tensile Extrusion of High-density Polyethylene: *Eric Brown*[1]; George Gray[1]; Kyle Ramos[1]; Dana Dattelbaum[1]; Brian Jensen[1]; Adam Iverson[2]; Carl Carlson[2]; Kamel Fezza[3]; [1]Los Alamos National Laboratory; [2]National Security Technologies, LLC; [3]The Advanced Photon Source

4:10 PM Invited
Accelerated Densification via Localized Contact Heating: Spark-plasma Sintering vs. High Voltage Electric Discharge Consolidation: *Eugene Olevsky*[1]; Evgeny Grigoryev[2]; [1]San Diego State University; [2]Moscow Engineering Physics University

4:30 PM Invited
Synthesis of Bulk Nanostructured Materials in Ti-Al-Ni System By Mechanical Alloying and Explosive Consolidation: Nikoloz Chikhradze; *Fernand Marquis*[1]; G. Abashidze; Mikheil Chikhradze; [1]Naval Postgraduate School

4:50 PM Invited
Hot Explosive Consolidation Novel Nanostructured W-Ag Composites: *Akaki Peikrishvil*[1]; Bagrat Godibadze[1]; Elguja Chagelishvili[1]; Grigor Mamniashvili[1]; Merab Tsiklauri[1]; [1]Tsulukidze Mining Institute

5:10 PM
Characterization of the Dynamic Behavior of Recycled Polypropylene-based Composites: *Nadia Bahlouli*[1]; [1]University of Strasbourg

Electrode Technology for Aluminium Production — Anode Raw Materials

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Andre Proulx, Rio Tinto Alcan

Monday PM
February 17, 2014
Room: 14B
Location: San Diego Convention Center

Session Chair: Frank Cannova, BP

4:00 PM Introductory Comments

4:05 PM
Impurity Level Distribution in GPC and CPC and Impact on Anode Properties: *Les Edwards*[1]; [1]Rain CII Carbon

4:30 PM
Determination of Contact Angle from Raw Material Properties Using Linear Multivariable Analysis: *Arunima Sarkar*[1]; Duygu Kocaefe[1]; Yasar Kocaefe[1]; Dipankar Bhattacharyay[1]; Brigitte Morais[2]; Charles-Luc Lagacé[2]; [1]University of Quebec of Chicoutimi; [2]Aluminerie Alouette Inc

4:55 PM
Use of Coal Tar Pitch Coke for Producing Prebaked Electrodes: Shoulei Gao[1]; Chongai Bao[1]; *Euel Cutshall*[1]; Baiyuan Xia[1]; Rifu Lin[1]; Guanghui Lang[1]; Joe Woo[1]; [1]Sunstone Development Co., Ltd

5:20 PM
Characterization of Dry Aggregates in Carbon Anodes by Image Analysis: *Dipankar Bhattacharyay*[1]; Duygu Kocaefe[1]; Yasar Kocaefe[1]; Arunima Sarkar[1]; Brigitte Morais[2]; Jerome Chabot[2]; [1]University of Quebec at Chicoutimi; [2]Aluminerie Alouette Inc.

Energy Technologies and Carbon Dioxide Management — Energy in Iron and Steel

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Education Committee, TMS: Energy Committee
Program Organizers: Cong Wang, Northwestern University; Jan de Bakker, BBA, Inc; Cynthia Belt, Consultant; Animesh Jha, University of Leeds; Neale Neelameggham, Ind LLC; Soobhankar Pati, MOxST Inc.; Leon Prentice, CSIRO

Monday PM
February 17, 2014
Room: Balboa
Location: San Diego Marriott Marquis & Marina

Session Chairs: Wanlin Wang, Central South University; Il Sohn, Yonsei University

2:00 PM Keynote
Determination of Energy Requirements for Ironmaking Processes: It's Not that Straightforward: Hong Yong Sohn[1]; *Miguel Olivas-Martinez*[1]; [1]University of Utah

2:30 PM Invited
Blast Furnace Ironmaking: Process Alternatives and Carbon Intensity: *P. Chris Pistorius*[1]; Jorge Gibson[1]; Megha Jampani[1]; [1]Carnegie Mellon University

3:00 PM Invited
From Carbon towards Hydrogen in the Steel Industry : Fundamental Aspects and Concerns: *Il Sohn*[1]; [1]Yonsei University

3:25 PM Break

3:45 PM Keynote
Flexibility-The Key to Sustainability in Steel Manufacturing: *Sridhar Seetharaman*[1]; [1]University of Warwick

4:15 PM Invited
Green Slag System Design during Continuous Casting: *Wanlin Wang*[1]; Juan Wei[1]; Boxun Lu[1]; Lejun Zhou[1]; [1]Central South University

4:40 PM Invited
Innovative Hydrogen Production Process Utilizing Thermal and Chemical Energies of Steelmaking Slag: *Hiroyuki Matsuura*[1]; Fumitaka Tsukihashi[1]; [1]The University of Tokyo

5:05 PM
A Laboratory Experiment Study on Iron Phase Formation during Hydrogen Reduction of Iron Oxides in the Molten Slag: *ChuanJie Cai*[1]; ShaoBo Zheng[1]; XueBin Hao[1]; HuiGai Li[1]; [1]ShangHai University

Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention — Microstructure-sensitive and Multiscale Modeling of Fatigue

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Antonios Kontsos, Drexel University; Tongguang Zhai, University of Kentucky

Monday PM
February 17, 2014
Room: 7B
Location: San Diego Convention Center

Session Chairs: Michael Sangid, Purdue University; Antonios Kontsos, Drexel University

2:00 PM Introductory Comments

2:05 PM Keynote
Microstructure Sensitivity and Uncertainty in Modeling Fatigue Crack Formation and Early Growth in Advanced Alloys: *David McDowell*[1]; [1]Georgia Institute of Technology

2:45 PM Invited
A Multi-stage Approach for Microstructure-sensitive Modeling of Fatigue Damage in Metals: *J Jordon*[1]; [1]The University of Alabama

3:05 PM Invited
Assessment of Models for Prediction of Small Crack Growth Behavior in Nickel and Titanium Alloys: *Christopher Szczepanski*[1]; R. John[1]; K. Jha[2]; P. J. Golden[1]; [1]US Air Force Research Laboratory; [2]Universal Technology Corporation

3:25 PM Invited
Statistical Modeling for Low Cycle Fatigue: *D Gary Harlow*[1]; [1]Lehigh University

3:45 PM Break

4:05 PM
Cyclic Plastic Slip Activity and Early Stages of Fatigue Damage in FCC Polycrystals: Experiments and Simulations with Application to 316L Stainless Steels: Patrick Villechaise[1]; *Loïc Signor*[1]; Van Truong Dang[1]; Emmanuel Lacoste[1]; Thomas Ghidossi[1]; Stephan Courtin[2]; [1]ENSMA/Institut Pprime-UPR CNRS3346; [2]AREVA-NP

4:25 PM
Influence of Microstructure Variability on Short Crack Growth Behavior: *Andrea Rovinelli*[1]; Michael Sangid[1]; Ricardo Lebensohn[2]; [1]Purdue University; [2]Los Alamos National Laboratory

4:45 PM
Micro-mechanics Modeling of Surface Roughness Evolution under Thermo-mechanical Fatigue: *Ahmed Hussein*[1]; Jaafar El-Awady[1]; [1]Johns Hopkins University

5:05 PM
Quantification of Fatigue Weaklinks: *Lin Yang*[1]; Tongguang Zhai[1]; [1]University of Kentucky

5:25 PM Concluding Comments

Gamma TiAl Alloys 2014 — Session II

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Titanium Committee
Program Organizers: Young-Won Kim, Gamteck, Inc.; Wilfried Smarsly, MTU Aero Engines GmbH; Junpin Lin, University of Science and Technology Beijing; Dennis Dimiduk, Air Force Research Laboratory; Fritz Appel, Helmholtz Zentrum Geesthacht

Monday PM
February 17, 2014
Room: 6B
Location: San Diego Convention Center

Session Chairs: David Hu, University of Birmingham; Celine Marcillaud, SNECMA

2:00 PM Invited
Alloy Design Concepts for Wrought High Temperature TiAl Alloys: *Junpin Lin*[1]; Xiangjun Xu[2]; Laiqi Zhang[1]; Yongfeng Liang[1]; Yong Xu[3]; Guojian Hao[1]; [1]University of Science and Technology Beijing; [2]Materials and Chemistry School, Zhongyuan University of Technology; [3]School of Materials Science and Engineering, Shandong Jianzhu University

2:25 PM
Microstructure and Properties of a Cast Ti-46Al-8Ta Alloy: *Juraj Lapin*[1]; Zuzana Gabalcova[1]; Oto Bajana[1]; Tatiana Pelachova[1]; Hana Stanekova[1]; [1]Institute of Materials and Machine Mechanics, Slovak Academy of Sciences

2:45 PM
High Nb Content TiAl Alloys Specified to Cast Process: *Ji Zhang*[1]; [1]China Iron and Steel Research Institute Group

3:05 PM Invited
The Use of In Situ Characterization Techniques for the Development of Intermetallic Titanium Aluminides: *Svea Mayer*[1]; Helmut Clemens[1]; Wilfried Smarsly[2]; [1]Montanuniversitaet Leoben; [2]MTU Aero Engines AG

3:30 PM Break

3:50 PM
Phase Composition and Microstructural Analysis of Titanium Aluminides by In Situ, Real-time Neutron and Synchrotron X-ray Techniques: *Klaus-Dieter Liss*[1]; [1]Japan Atomic Energy Agency; Australian Nuclear Science and Technology Organisation

4:10 PM Invited
Fabrication of TiAl Alloys by Powder Metalurgical Methods at Tecnalia: *Miguel Lagos*[1]; Iñigo Agote[1]; [1]Tecnalia

4:35 PM
Effect of Powder Pre-treatment on the Mechanical Properties of Powder Metallurgy Ti-47Al-2Cr-2Nb-0.15B: *Xu Lei*[1]; Wu Jie[1]; Cui Yuyou[1]; Yang Rui[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

4:55 PM
High Performance TiAl Alloys Realized by Spark Plasma Sintering: *Thomas Voisin*[1]; Jean-Philippe Monchoux[1]; Marc Thomas[2]; Helmut Clemens[3]; Alain Couret[1]; [1]CEMES/CNRS; [2]DMSN/ONERA; [3]Montanuniversitat Leoben

5:15 PM
Microstructure and Mechanical Properties of TiAl Alloys Produced by Powder Metallurgy: *Fantao Kong*[1]; Ning Cui[1]; Ping Sun[1]; Dezhong Wu[1]; [1]Harbin Institute of Technology

High-temperature Gamma (f.c.c.) /Gamma-Prime (L12 structure) Co-Al-W Based Superalloys — Oxidation and Alloying Effects on Mechanical Behavior

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee
Program Organizers: David Seidman, Northwestern University; David Dunand, Northwestern University; Chantal Sudbrack, NASA Glenn Research Center; Carelyn Campbell, National Institute of Standards and Technology; Ursula Kattner, National Institute of Standards and Technology; David Dye, Imperial College

Monday PM
February 17, 2014

Room: 5A
Location: San Diego Convention Center

Session Chairs: David Dunand, Northwestern University; David Dye, Imperial College

2:00 PM Plenary
Mechanical Properties of Co-based Superalloys with L_{12} Cuboidal Precipitates: *Haruyuki Inui*[1]; [1]Kyoto University

2:40 PM
High Temperature Oxidation of New γ/γ' Co–Al–W Based Superalloys: *Leonhard Klein*[1]; Sannakaisa Virtanen[1]; [1]University of Erlangen-Nürnberg

3:00 PM
Elementary Processes during the Oxidation of Ternary Co-base Superalloys: *Martin Weiser*[1]; Sannakaisa Virtanen[1]; [1]Friedrich-Alexander-Universitaet Erlangen-Nuernberg

3:20 PM Break

3:40 PM Invited
The Effect of Rhenium in Co-base Superalloys – A Comparison with Ni-base Superalloys: *Steffen Neumeier*[1]; Christopher Zenk[1]; Hamad Rehman[1]; Mathias Goeken[1]; [1]University of Erlangen-Nuremberg

4:10 PM
The Influence of Boron and Carbon on Grain Boundary Strength of γ'-Hardened Co-base Superalloys: *Lisa Freund*[1]; Steffen Neumeier[1]; Alexander Bauer[1]; Mathias Göken[1]; [1]University Erlangen-Nuernberg

4:30 PM
B and Zr Additions as Grain Boundary Strengtheners in a Model Co-based Superalloy: *Peter Bocchini*[1]; Chantal Sudbrack[2]; Ronald Noebe[2]; David Dunand[1]; David Seidman[2]; [1]Northwestern University; [2]NASA Glenn Research Center

4:50 PM
Effect of Ti and Ta on the Creep Properties of Single Crystal Co-Al-W-base Superalloys: Fei Xue[1]; Haijing Zhou[1]; Xuhua Chen[1]; Meiling Wang[1]; Xianfei Ding[1]; *Qiang Feng*[1]; [1]University of Science and Technology Beijing

High-temperature Material Systems for Energy Conversion and Storage — Solid Oxide Fuel Cells I

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee
Program Organizers: Kyle Brinkman, Savannah River National Laboratory (SRNL); Xingbo Liu, West Virginia University; Kevin Huang, University of South Carolina

Monday PM
February 17, 2014

Room: Carlsbad
Location: San Diego Marriott Marquis & Marina

Session Chairs: Kevin Huang, University of South Carolina; Kyle Brinkman, Savannah River National Laboratory (SRNL)

2:00 PM Invited
Advanced Anodes for Solid Oxide Fuel Cells: *Fanglin (Frank) Chen*[1]; [1]University of South Carolina

2:30 PM Invited
Ionic Solid Oxides for High Temperature Optical Gas Sensing in Fossil Fuel Based Power Plants: *Junhang Dong*[1]; Xiling Tang[1]; Kurtis Remmel[1]; Hongmin Jiang[1]; [1]University of Cincinnati

3:00 PM Invited
Insights into the Structure and Functional Application of Sr2CoMoO6 for Solid Oxide Fuel Cells: *Chunwen Sun*[1]; [1]Institute of Physics, Chinese Academy of Sciences

3:30 PM Break

3:55 PM
In Situ Study of Oxygen Exchange at Perovskite Electrode Surfaces in Different Environments: *Monika Backhaus-Ricoult*[1]; [1]Corning Inc.

4:15 PM
Advanced Conductive Coating Process for Planar SOFC Stacks: *Jung Pyung Choi*[1]; Jeffry Stevenson[1]; Eric Riel[1]; Jeff Bonnett[1]; YS Chou[1]; [1]Pacific Northwest National Laboratory

Hume-Rothery Award Symposium: Thermodynamics and Kinetics of Engineering Materials — Thermodynamic and Kinetic Modeling and Experiments

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee
Program Organizers: Hans Juergen Seifert, Karlsruhe Institute of Technology (KIT); Alan Luo, The Ohio State University; Peter Uggowitzer, ETH Zürich; Fan Zhang, CompuTherm, LLC

Monday PM
February 17, 2014

Room: 6C
Location: San Diego Convention Center

Session Chairs: Zhang Yong, University of Science and Technology Beijing; André Schneider, Vallourec & Mannesmann Tubes

2:00 PM Invited
Solving Inverse Problems in Phase Stability: A Design Theoretic Approach: *Raymundo Arroyave*[1]; Sean Gibbons[1]; Edgar Galvan[1]; Shengyen Li[1]; Richard Malak[1]; [1]Texas A & M University

2:20 PM
A Semi-Empirical Model to Implement Thermal and Electrical Conductivity of Metallic Systems into the CALPHAD Framework: Changdong Wei[1]; Wolfgang Windl[1]; *Ji-Cheng Zhao*[1]; [1]The Ohio State University

2:40 PM
CALPHAD and Its Development for Materials Genome: *Wei Xiong*[1]; Gregory B. Olson[1]; Qing Chen[2]; Malin Selleby[3]; [1]Northwestern University; [2]Thermo-Calc Software Company; [3]KTH Royal Institute of Technology

3:00 PM Invited
Phase Reaction Equations and Their Applications: *Shuanglin Chen*[1]; Weisheng Cao[1]; Fan Zhang[1]; Jun Zhu[1]; Chuan Zhang[1]; Rainer Schmid-Fetzer[2]; [1]CompuTherm, LLC; [2]Clausthal University of Technology

3:20 PM Invited
Detecting Errors in Multicomponent Diffusivities Using One Diffusion Couple: *John Morral*[1]; [1]The Ohio State University

3:40 PM Break

4:00 PM
Measurement of the Growth Rate of Solidifying Dendritic Grains Observed by Synchrotron Real-time X-ray Radiography: *Arvind Prasad*[1]; Stuart McDonald[1]; Kazuhiro Nogita[1]; Kentaro Uesugi[2]; Hideyuki Yasuda[3]; David StJohn[1]; [1]University of Queensland; [2]JASRI; [3]Kyoto University

4:20 PM Invited
Liquid Film Migration – Driving Force and Migration Direction: *Markus Rettenmayr*[1]; [1]Friedrich Schiller University Jena

4:40 PM
Interdiffusion Microstructure Maps of Multi-component and Multi-phase Dual-alloy Systems: *Xiaoqin Ke*[1]; John Morral[1]; Yunzhi Wang[1]; [1]The Ohio State University

ICME: Linking Microstructure to Structural Design Requirements — ICME: Linking Microstructure to Structural Design Requirements II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Rajiv Mishra, University of North Texas; David Furrer, Pratt & Whitney; Peter Collins, University of North Texas; Charles Ward, Air Force Research Laboratory; Craig McClung, Southwest Research Institute

Monday PM
February 17, 2014
Room: 31A
Location: San Diego Convention Center

Session Chair: David Furrer, Pratt & Whitney

2:00 PM Invited
Linking ICME to Component Life Management during Design: *Craig McClung*[1]; Michael Enright[1]; [1]Southwest Research Institute

2:40 PM Invited
Toward Integrated Life-limit Materials Engineering of Turbine Engine Superalloys: *James Larsen*[1]; Sushant Jha[2]; Reji John[1]; Andrew Rosenberger[1]; Dennis Buchanan[3]; William Porter[3]; Alisha Hutson[3]; Vikas Sinha[4]; Jay Jira[1]; Siamack Mazdiyasni[1]; [1]Air Force Research Laboatory; [2]UTC; [3]University of Dayton Research Institute; [4]UES, Inc.

3:20 PM
A Microstructure-based Method of Predicting the Probability of Life-limiting Fatigue Failures: *Sushant Jha*[1]; Christopher Szczepanski[2]; Robert Brockman[3]; Craig Przybyla[2]; Reji John[2]; James Larsen[2]; [1]Air Force Research Laboratory/Universal Technology Corporation; [2]Air Force Research Laboratory; [3]University of Dayton Research Institute

3:40 PM Break

4:00 PM
Probabilistic Prediction of Minimum Fatigue Life of a Shot Peened Titanium Alloy: *Reji John*[1]; Sushant Jha[2]; James Larsen[1]; [1]Air Force Research Laboratory; [2]Universal Technology Corporation

4:20 PM
Computational and Experimental Evaluation of Effect of Primary Al3Sc Particles on Fatigue Behavior of an Al-Mg-Sc Alloy: *Mageshwari Komarasamy*[1]; Nilesh Kumar[1]; Rajiv Mishra[1]; [1]University of North Texas

4:40 PM
Microstructural Effects on the Cyclic Response of FCC Metallic Alloys – A Dislocation Dynamics Study: *Ranga Nikhil Yellakara*[1]; Zhiqiang Wang[1]; [1]University of North Texas

Light-metal Matrix (Nano)-composites — Microstructure-Property Relationships I

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee, TMS: Magnesium Committee
Program Organizers: Wim Sillekens, European Space Agency; Dmitry Eskin, Brunel University

Monday PM
February 17, 2014
Room: 17B
Location: San Diego Convention Center

Session Chair: Wim Sillekens, European Space Agency

2:00 PM Introductory Comments

2:10 PM Keynote
An Insight into Processing and Characteristics of Magnesium-based Composites: *Manoj Gupta*[1]; [1]National University of Singapore

2:40 PM
Effect of Process Control Agent on the Microstructure and Mechanical Behavior of an Aluminum and B4C Metal Matrix Composite: *Clara Hofmeister*[1]; Anit Giri[2]; Sarah Brennan[2]; Timothy Delahanty[3]; Yongho Sohn[1]; Kyu Cho[2]; [1]UCF; [2]U.S. Army Research Laboratory, Weapons & Materials Research Directorate; [3]Pittsburgh Materials Technology, A Division of Thermacore

3:00 PM
Hot Extruded Carbon Nanotube Reinforced Magnesium Matrix Composites and Its Microstructure, Mechanical and Corrosion Properties: *Harun Mindivan*[1]; Arife Efe[1]; Eyup Kayali[2]; [1]Ataturk University; [2]Istanbul Technical University

3:20 PM Break

3:40 PM
Microstructure and Damping Properties of Al Wires Reinforced by Al2O3 Nanoparticles: *Riccardo Casati*[1]; Maurizio Vedani[1]; Ausonio Tuissi[2]; Elena Villa[2]; Xianshun Wei[3]; Kenong Xia[3]; [1]Politecnico di Milano; [2]CNR-IENI; [3]University of Melbourne

4:00 PM
Elevated Temperature Deformation Behavior of High Strength Al-Cu-Mg-Ag Based Alloy Reinforced by TiB2 Particles: *Martha Indriyati*[1]; Vit Janik[1]; Richard J. Dashwood[1]; [1]University of Warwick

4:20 PM
Hardening and Softening Processes in an AJ51 Magnesium Alloy Reinforced with Short Saffil Fibres: *Zuzanka Trojanova*[1]; Kristián Máthis[1]; Gergely Farkas[1]; [1]Charles University

4:40 PM
Understanding the Role of Nanodispersion on the Properties of A390 Hyper-eutectic AlSi Cast Alloy: *Iman El Mahallawi*[1]; Othman Othman[1]; Mohamed Abdelaziz[2]; Hossam Raed[1]; Tareq Abd El-Fattah[1]; Sherif Nasr[2]; [1]Cairo University; [2]British University, Egypt

5:00 PM
Effects of AlB2 Particles and Zinc on the Mechanical Properties of a Series of Aluminum Matrix Composites: *Marcos Corchado*[1]; Fernando Reyes[2]; Marivic Hernández[1]; O. Marcelo Suárez[3]; [1]Mechanical Engineering Department, University of Puerto Rico, Mayagüez; [2]Industrial Engineering Department, University of Puerto Rico, Mayagüez; [3]General Engineering Department, University of Puerto Rico, Mayagüez

Long-term Stability of High Temperature Materials — Phase Changes in Bulk Material II and Surface Degradation

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee
Program Organizers: Mark Hardy, Rolls-Royce plc; Awadh Pandey, Pratt & Whitney Rocketdyne; David Mourer, General Electric Aircraft Engines; Jeffrey Hawk, National Energy Technology Laboratory

Monday PM
February 17, 2014
Room: 4
Location: San Diego Convention Center

Session Chairs: David Mourer, GE Aircraft Engines; Awadh Pandey, Pratt & Whitney Rocketdyne

2:00 PM
Long Term Stability of the Rene 65 Cast and Wrought Nickel Superalloy: *Andrew Wessman*[1]; [1]GE Aviation

2:20 PM
The Coarsening Behavior of NiAl Precipitates in NiAl-strengthened Ferritic Alloys at 973 and 1,073 K: *Zhiqian Sun*[1]; Jan Ilavsky[2]; Gian Song[1]; Gongyao Wang[1]; Peter Liaw[1]; [1]The University of Tennessee; [2]Advanced Photon Source, Argonne National Laboratory

2:40 PM
Investigating Oxidation and Oxygen Transport in an Advanced Polycrystalline Nickel-based Superalloy Under Static Loads: Benjamin Foss[1]; *Barbara Shollock*[1]; David McPhail[1]; Mark Hardy[2]; [1]Imperial College London; [2]Rolls-Royce plc

3:00 PM
Combinatorial Assessment of the Oxidation Behavior of Titanium Alloys: *Peyman Samimi*[1]; David Brice[1]; Peter Collins[1]; [1]University of North Texas

3:20 PM Break

3:40 PM
Bond Coat Cavitation under CMAS-Infiltrated Thermal Barrier Coatings: *Kaylan Wessels*[1]; R. Jackson[1]; Douglas Konitzer[2]; Matthew Begley[1]; Tresa Pollock[1]; Carlos Levi[1]; [1]University of California, Santa Barbara; [2]GE Aviation

4:00 PM
Oxide Recession in High-temperature High-velocity Water Vapor: *Robert Golden*[1]; Elizabeth Opila[1]; [1]University of Virginia

4:20 PM
Diffuse Interface Modeling on Thermal Oxidation of Metals: *Tian-Le Cheng*[1]; You-Hai Wen[1]; Jeffrey Hawk[1]; [1]National Energy Technology Laboratory

4:40 PM
The Oxidation-resistance Properties of Iron-based Superalloys between 1473 and 1523K: *Xuan Chen*[1]; [1]Shanghai University

Magnesium Technology 2014 — Powders, Recycling, Hydrometallurgy, Primary Production, and Creep

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Martyn Alderman, Magnesium Elektron; Norbert Hort, Helmholtz-Zentrum Geesthacht; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

Monday PM
February 17, 2014

Room: 17A
Location: San Diego Convention Center

Session Chairs: Neale Neelameggham, IND LLC; Petra Maier, Fachhochschule Stralsund - University of Applied Sciences

2:00 PM
Emerging Applications Using Mg Alloy Powders: A Feasibility Study: *Rajiv Tandon*[1]; Deepak Madan[1]; [1]Magnesium Elektron Powders

2:20 PM
Isothermal Hydrogenation Kinetics Study of Magnesium Hydride with TiH_2 Additive: *Jingzhu Li*[1]; Peng Fan[1]; Zak Fang[1]; Chengshang Zhou[1]; [1]University of Utah

2:40 PM
Recovery of Rare Earth Metals in Used Magnets by Molten Magnesium: *Tomohiko Akahori*[1]; Yu Miyamoto[1]; Tomonori Saeki[1]; Masahide Okamoto[1]; Toru Okabe[2]; [1]Hitachi.Ltd; [2]The University of Tokyo

3:00 PM
Recovery of Magnesium and Recycling of Spent Solution in Chloride-based Atmospheric Acid Leaching of Laterite: *Yong Ge*[1]; Weizhong Ding[1]; Dingsheng Tan[1]; Shuqiang Guo[1]; [1]Shanghai Key Laboratory of Modern Metallurgy & Materials Processing, Shanghai University

3:20 PM Break

3:40 PM
Effect of Physical Properties of Dolomite on Carbothermic Reduction: *Siya Wang*[1]; Yu Wang[1]; Guangyong Bin[1]; Jiang Diao[1]; [1]College of Materials Science and Engineering, Chongqing University

4:00 PM
Time Dependent Springback of a Magnesium Alloy: *Bin Li*[1]; Zackery McClleland[1]; S.J. Horstemeyer[1]; Imran Aslam[1]; P.T. Wang[1]; M.F. Horstemeyer[1]; [1]Center for Advanced Vehicular Systems

4:20 PM
Precipitate Formation in Uniaxially Stressed High Pressure Die Cast Binary Mg-Nd Alloy during Creep Testing: *Deep Choudhuri*[1]; Nilesh Dendge[1]; Soumya Nag[1]; Mark Gibson[2]; Rajarshi Banerjee[1]; [1]University of North Texas; [2]CAST CRC and CSIRO Process Science & Engineering

4:40 PM
A Review of the Influence of Production Methods and Intermetallic Phase on the Creep Properties of AZ_{91}: *Peiman Shahbeigi Roodposhti*[1]; Korukonda Murty[1]; Apu Sarkar[1]; [1]North Carolina State University

5:00 PM
Indentation Creep Behavior of Mg-10Gd-3Y-0.5Zr (wt.%) Alloy at Elevated Temperatures: Huan Wang[1]; *Qudong Wang*[1]; Jie Yuan[1]; [1]Shanghai Jiao Tong University

5:20 PM
Consolidation of Blended Magnesium Powders by Microwave Processing: *M. Ashraf Imam*[1]; Benjamin Rock[1]; Arne Fliflet[1]; Jerry Feng[1]; [1]Naval Research Laboratory

Magnetic Materials for Energy Applications IV — Rare Earth Permanent Magnets: Processing, Characterization and Modeling

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Magnetic Materials Committee
Program Organizers: Thomas G. Woodcock, IFW Dresden; Julia Lyubina, Evonik Industries AG; Matthew Willard, Case Western Reserve University

Monday PM
February 17, 2014

Room: Ballroom G
Location: San Diego Marriott Marquis & Marina

Session Chairs: Thomas G. Woodcock, IFW Dresden; Ralph Skomski, University of Nebraska-Lincoln

2:00 PM Invited
Magnetic Materials for Green Innovation: *Michael Coey*[1]; [1]Trinity College Dublin

2:30 PM Invited
Microstructure and Coercivity Relationships of Anisotropic Hot-deformed Nd-Fe-B Magnets: *Hossein Sepehri Amin*[1]; J. Liu[2]; T. Akiya[1]; T. Ohkubo[1]; K. Hioki[3]; A. Hattori[3]; K. Hono[1]; [1]Elements Strategy Initiative Center for Magnetic Materials, National Institute for Materials Science; [2]Graduate School of Pure and Applied Sciences, University of Tsukuba; [3]Daido Corporate Research & Development Center, Daido Steel Co. Ltd.

3:00 PM
Coercivity Enhancement of NdFeB Sintered Magnet by Grain Refinement
: *Jin Woo Kim*[1]; Seong Yeul Kwak[1]; Seok Hyun Hwang[1]; Young Do Kim[1]; [1]Hanyang University

3:20 PM
Incorporating Dy in Rare-earth Magnets Through a Low Melting Dy-rich Phase: *Peter Moran*[1]; Stephen Hackney[1]; Jie Li[1]; Li Chen[1]; [1]Michigan Technological University

3:40 PM Break

3:55 PM
Microstrucutre of HRE Grain Boundary Diffusion Processed Nd-Fe-B Sintered Magnets: U. M. R. Seelam[1]; T. Ohkubo[1]; T. Abe[1]; S. Hirosawa[1]; *Kazuhiro Hono*[1]; [1]National Institute for Materials Science

4:15 PM Invited
What Micromagnetics Tells Us about the Coercive Field of Permanent Magnets: *Thomas Schrefl*[1]; Simon Bance[1]; Tetsuya Shoji[2]; Masao Yano[2]; Akira Manabe[2]; [1]St. Poelten University of Applied Sciences; [2]Toyota Motor Corporation

4:45 PM Invited
Ab Initio to Continuum Modelling of Nd-Fe-B Magnets and Interfaces: *Gino Hrkac*[1]; Thomas Woodcock[2]; Oliver Gutfleisch[3]; Richard Evans[4]; Roy Chantrell[4]; Thomas Schrefl[5]; [1]University of Exeter; [2]IFW Dresden; [3]TU Darmstadt; [4]University of York; [5]Univeristy of Applied Sciences

5:15 PM Invited
Formation of the Fcc-NdO_x Phase at Nd/Nd-Fe-B Interface: First-principles Modeling: *Ying Chen*[1]; Arkapol Saengdeejing[1]; Ken Suzuki[1]; Hideo Miura[1]; Satoshi Sugimoto[1]; [1]Tohoku University

Materials and Fuels for the Current and Advanced Nuclear Reactors III — Fuels II

Sponsored by: TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee
Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Monday PM
February 17, 2014
Room: 33C
Location: San Diego Convention Center

Session Chair: Dennis Keiser, Idaho National Laboratory

2:00 PM Invited
Accident Tolerant Fuels for Light Water Reactors: *Steven Zinkle*[1]; Kurt Terrani[1]; Lance Snead[1]; [1]Oak Ridge National Laboratory

2:25 PM
Modifying Ceramic Fuel Pellets to Improve UO2 Properties: *Rafael Leckie*[1]; Erik Luther[1]; Ken McClellan[1]; Pallas Papin[1]; Tom Wynn[1]; [1]Los Alamos National Laboratory

2:40 PM
Development of Fabrication Process Methodologies for Ceramic Fuel Pellets: *Erik Luther*[1]; Ken McClellan[1]; Rafael Leckie[1]; Pallas Papin[1]; Thomas Wynn[1]; [1]LANL

2:55 PM
Fabrication and Properties of High Thermal Conductivity UO_2, UO_2-SiC, UO_2-Diamond, and UO_2-CNTComposites Using Spark Plasma Sintering: *Ghatu Subhash*[1]; [1]University of Florida

3:10 PM Invited
Lab-scale Methods to Enable the Selection of Nuclear Fuel Concepts for Development: *Sean McDeavitt*[1]; [1]Texas A&M University

3:35 PM Break

3:50 PM Invited
Interatomic Potentials Accuracy: How Do They Bridge the Scales? U-Mo Fuel Case: *Vladimir Stegailov*[1]; Daria Smirnova[1]; Alexey Kuksin[1]; Sergey Starikov[1]; [1]Joint Institute for High Temperatures RAS, MIPT

4:15 PM
Atomistic Investigation of Ionic Conductivity in Chorimum-doped Urania Fuel: *Richard Hoffman III*[1]; Rakesh Behera[1]; Chaitanya Deo[1]; [1]Georgia Institute of Technology

4:30 PM
Synthesis of U_3Si_2 by High-energy Ball Milling: *Gordon Alanko*[1]; Brian Jaques[1]; Darryl Butt[1]; [1]Boise State University

5:00 PM
Microstructure of Aluminum Matrix in Composite Absorber Block Material: *Donna Guillen*[1]; Jatuporn Burns[2]; [1]Idaho National Laboratory; [2]Boise State University-Idaho Falls

4:45 PM
Ion Irradiation Enhanced Interdiffusion in Uranium-iron System: *Tianyi Chen*[1]; Bulent Sencer[2]; Lin Shao[1]; Rory Kennedy[2]; [1]Texas A&M University; [2]Idaho National Laboratory

5:15 PM
Sink Strengths of Grain Boundaries in Irradiated Nanocrystalline Materials: *Chao Jiang*[1]; Narasimhan Swaminatham[2]; Dane Morgan[1]; Izabela Szlufarska[1]; [1]University of Wisconsin; [2]Indian Institute of Technology Madras

Materials Processing Fundamentals — Process & Properties Control

Sponsored by: TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee
Program Organizers: James Yurko, Materion Brush Beryllium and Composites; Lifeng Zhang, University of Science and Technology Beijing; Antoine Allanore, Massachusetts Institute of Technology; Cong Wang, Northwestern University

Monday PM
February 17, 2014
Room: 11B
Location: San Diego Convention Center

Session Chair: James Yurko, Materion

2:00 PM
Determination of Processing Window for the In Situ Control of Microstructure of Cold-sprayed Materials: *Jonghyun Lee*[1]; Robert Hyers[1]; David Schmidt[1]; [1]University of Massachusetts

2:20 PM
Simulating Particle Impact to Predict the Mechanical Properties of Cold Sprayed Alloys: *Luke Bassett*[1]; Richard Sisson[1]; Victor Champagne[2]; Diran Apelian[1]; [1]Worcester Polytechnic Institute; [2]Army Research Laboratory

2:40 PM
Preliminary Investigations into the Ultra-rapid Manufacturing of Micro/Nano-scale Materials: *K. Stewart*[1]; D. Cavero[1]; S Weerasuriya[1]; K. Morsi[1]; [1]San Diego State University

3:00 PM
Effect of Different Parameters on Breakouts in Billet Caster: *Ram Singh*[1]; [1]National Institute of Technology, Jamshedpur

3:20 PM Break

3:35 PM
Numerical Investigation of the Pressure Effects on Thermal Behavior during Spark Plasma Sintering: *Alan Williamson*[1]; Baolong Zheng[1]; Enrique Lavernia[1]; Joanna Groza[1]; Jean-Pierre Delplanque[1]; [1]University of California, Davis

3:55 PM
Initial Stage Kinetics of Oxide Dispersion Strengthened Alloys Sintered by Spark Plasma Sintering: *Kerry Allahar*[1]; Jatuporn Burns[1]; Yaqiao Wu[1]; Brian Jaques[1]; Darryl Butt[1]; [1]Boise State University

4:15 PM
Microstructure Evolution in Nano-reinforced Ferritic Steel Processed by Mechanical Alloying and Spark Plasma Sintering: *Xavier Boulnat*[1]; Damien Fabrègue[2]; Michel Perez[2]; Marie-Hélène Mathon[3]; Thierry Douillard[2]; Yann de Carlan[1]; [1]CEA, DEN; [2]INSA Lyon - MATEIS; [3]Laboratoire Leon Brillouin

4:35 PM
Effect of Porosity on Phase Transformation and Mechanical Behaviors of Powder Metallurgy Steels: *Jooyoung Park*[1]; Gowoon Jeong[1]; Singon Kang[1]; Donghyun Bae[2]; Hyunjoo Choi[1]; [1]Kookmin University; [2]Yonsei University

Mechanical Behavior at the Nanoscale II — Nanostructured Materials

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Evan Ma, Johns Hopkins University; Daniel Gianola, University of Pennsylvania; Ting Zhu, Georgia Institute of Technology; Julia Greer, California Institute of Technology

Monday PM
February 17, 2014
Room: 9
Location: San Diego Convention Center

Session Chairs: Daniel Gianola, University of Pennsylvania; Daniel Kiener, University of Leoben

2:00 PM Invited
Size Effects on the Martensitic Transformation in Shape Memory Alloy Microwires: Stian Ueland[1]; Nihan Tuncer[1]; *Christopher Schuh*[1]; [1]MIT

2:30 PM Invited
Nanostructured Metallic Muscles at Work: *Jeff De Hosson*[1]; Eric Detsi[1]; Patrick Onck[1]; [1]University of Groningen

3:00 PM
Nanoporous Au(Pt) with Electrochemically Tunable Strength: Xing-Long Ye[1]; *Hai-Jun Jin*[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

3:20 PM
Load Drop and Slip Step Statistics in Cast Aluminium and Magnesium Microwires: Jerome Krebs[1]; Suzanne Verheyden[1]; *Andreas Mortensen*[1]; [1]Ecole Polytechnique Fédérale de Lausanne (EPFL)

3:40 PM Break

3:55 PM Invited
Atomic-scale Processes in Friction and Wear: *Robert Carpick*[1]; [1]University of Pennsylvania

4:25 PM
Atomistic Scale Observation on Deformation in Angstrom-sized Twin Gold Nanowires: *Scott Mao*[1]; Jiangwei Wang[1]; Frederic Sansoz[2]; Jianyu Huang; [1]University of Pittsburgh; [2]The University of Vermont

4:55 PM
In Situ TEM Compression of Co23at.%Ti Metallic Glasses: *Christoph Gammer*[1]; Christian Rentenberger[2]; David Geist[2]; Hans-Peter Karnthaler[2]; Andrew Minor[1]; [1]Department of Materials Science and Engineering, University of California, Berkeley and National Center for Electron Microscopy, Lawrence Berkeley National Laboratory; [2]Physics of Nanostructured Materials, University of Vienna

5:15 PM
Strain Localization in Amorphous Metallic Nanowires:Molecular Dynamics Simulations on the Influence of Size, Surface Relaxation State and Temperature: *Karsten Albe*[1]; Yvonne Ritter[1]; [1]TU Darmstadt

Mechanical Behavior Related to Interface Physics II — Interfacial Effects on Fracture and In situ Straining

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Nan Li, Los Alamos National Laboratory; Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Tonya Stone, Mississippi State University

Monday PM
February 17, 2014
Room: 11A
Location: San Diego Convention Center

Session Chairs: Nan Li, Los Alamos National Laboratory; Michael Demkowicz, Massachusetts Institute of Technology

2:00 PM Introductory Comments

2:05 PM Invited
Molecular Dynamics Based Study and Characterization of Deformation Mechanisms near a Crack in a Crystalline Material: *Somnath Ghosh*[1]; Jiaxi Zhang[1]; [1]Johns Hopkins University

2:35 PM
The Effects of Grain Boundary Volume Fraction and Relaxation State on Uniaxial Plasticity of Nanocrystalline Metals: *Amirhossein Khalajhedayati*[1]; Timothy Rupert[1]; [1]University of California Irvine

2:55 PM
Atomistic Simulation on the Structure and Mechanical Response of Σ3, Σ5 Tilt Grain Boundaries under Tension: *Liang Zhang*[1]; Cheng Lu[1]; Kiet Tieu[1]; Xing Zhao[1]; Linqing Pei[1]; Kuiyu Cheng[1]; [1]Faculty of Engineering and Information Sciences, University of Wollongong

3:15 PM Invited
Disclinations and the Mechanical Properties of Polycrystals: *Michael Demkowicz*[1]; Guoqiang Xu[1]; [1]Massachusetts Institute of Technology

3:45 PM Break

3:55 PM Invited
In Situ TEM Observations of Surface and Interface Phenomena during Nanomechanical Testing: *Andrew Minor*[1]; [1]UC Berkeley & LBL

4:25 PM
Investigation of Deformation in Al-Mg Alloys Using a Combined In Situ TEM Deformation/Dislocation Tomography Approach: *Josh Kacher*[1]; Peter Ercius[2]; Raja Mishra[3]; Andrew Minor[1]; [1]University of California, Berkeley; [2]National Center for Electron Microscopy; [3]General Motors Research and Development

4:45 PM
In Situ TEM Study of Dislocation-precipitate Interactions in Alpha Titanium-oxygen Solid Solutions: *Rachel Traylor*[1]; Qian Yu[1]; David Rugg[2]; John Morris[1]; Andrew Minor[1]; [1]University of California Berkeley; [2]Rolls Royce

5:05 PM Invited
Visualizing Displacive Versus Diffusive Plasticity of Sn: From "Smaller is Stronger" to "Smaller is Much Weaker": Lin Tian[1]; Ju Li[2]; Jun Sun[1]; Evan Ma[3]; *Zhiwei Shan*[1]; [1]Xi'an Jiaotong University; [2]MIT; [3]Johns Hopkins University

Nanostructured Materials for Rechargeable Batteries and Supercapacitors II — Session II

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee
Program Organizers: David Mitlin, University of Alberta and NINT NRC; Reza Shahbazian-Yassar, Michigan Technological University; Peter Kalisvaart, University of Alberta and NINT NRC

Monday PM
February 17, 2014
Room: Ballroom F
Location: San Diego Marriott Marquis & Marina

Session Chairs: Reza Shahbazian-Yassar, Michigan Technological University; David Mitlin, University of Alberta

2:00 PM Invited
Neutron Depth Profiling of Lithium Transport in All-solid-state Batteries: *Peter Notten*[1]; [1]Eindhoven University

2:15 PM Invited
Computer Simulation Study of Supercapacitors Based on Reduced Graphene Oxide Electrodes: *Hyung Kim*[1]; Andrew DeYoung[1]; Sang-Won Park[2]; YounJoon Jung[2]; [1]Carnegie Mellon University; [2]Seoul National University

2:30 PM Invited
Designing 3D Conical-Shaped Li-ion Micro-batteries: Daw Gen Lim[1]; *R. Edwin Garcia*[1]; [1]Purdue University

2:45 PM
Direct Spark Plasma Erosion Synthesis of Tin and silicon Alloy Nano-particulate Materials for Lithium Ion Batteries: *Emma White*[1]; Jordan Vetter[2]; Lisa Rueschhoff[2]; Steve Martin[2]; Iver Anderson[1]; [1]Ames Laboratory & Iowa State University; [2]Iowa State University

3:00 PM Invited
A Vertical Carbon Nanofiber Architecture for Li-ion Batteries and Supercapacitors: *Jun Li*[1]; [1]Kansas State University

3:15 PM Invited
Graphene-based Materials in Electrodes and Separators in Advanced Li-based Batteries: *Harold Kung*[1]; Mayfair Kung[1]; [1]Nonrthwestern University

3:30 PM Break

3:45 PM Invited
Current State of Lithium-sulfur Batteries: *Ilias Belharouak*[1]; Rui Xu[1]; [1]Argonne National Laboratory

4:00 PM Invited
Fabrication of Three-dimensional, Solid-state Lithium-ion Batteries Using All Aqueous Based Processes: *Derek Johnson*[1]; Amy Prieto[2]; [1]Prieto Battery, Inc.; [2]Colorado State University

4:15 PM Invited
Electrochemical Energy Storage in Polymer-based Electrodes: Opportunities and Challenges: *Jodie Lutkenhaus*[1]; [1]Texas A&M University

4:30 PM Invited
Developing and Understanding Earth-abundant Iron-based Conversion Cathode Nanomaterials for High Energy-Density Lithium-ion Batteries: Linsen Li[1]; *Song Jin*[1]; [1]University of Wisconsin-Madison

4:45 PM Invited
Nanoscale Materials Designing Concept Based on In Situ TEM Study of Structural and Chemical Evolution of Electrode in Electrochemical Cell: *Chongmin Wang*[1]; [1]Pacific Northwest National Laboratory

5:00 PM Invited
Polymer Nanocomposite Electrolytes for Flexible Lithium Ion Batteries: *Haleh Ardebili*[1]; [1]University of Houston

5:15 PM Invited
Carbon Nanotube Enhanced Lithium Ion Batteries: *Brian Landi*[1]; Michael Forney[1]; Matthew Ganter[1]; Jason Staub[1]; [1]Rochester Institute of Technology

Neutron and X-ray Studies of Advanced Materials VII: Challenges of the Future World — Complex Materials

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kostorz, ETH; Brent Fultz, California Institute of Technology; Peter Liaw, The University of Tennessee

Monday PM
February 17, 2014
Room: 10
Location: San Diego Convention Center

Session Chairs: Mike Manley, ORNL; Brent Fultz, CALTECH

2:00 PM Keynote
Atomic Dynamics and Viscosity in the Liquid: *Takeshi Egami*[1]; [1]University of Tennessee

2:40 PM Invited
Resonant Intrinsic Local Modes and Disorder as Generators of Relaxor Ferroelectric Behavior: *Michael Manley*[1]; [1]Oak Ridge National Laboratory

3:05 PM Invited
In-situ Nanofocused X-ray Diffraction in Combination with Atomic Force Microscopy for In-situ Mechanical Testing of Nanostructures: *Thomas Cornelius*[1]; Z. Ren[1]; F. Mastropietro[1]; A. Davydok[1]; M.-I. Richard[1]; Olivier Thomas; S. Langlais[2]; M. Dupraz[2]; G. Beutier[2]; M. Verdier[2]; [1]Aix-Marseille Université, CNRS, IM2NP; [2]SIMaP, Grenoble Institute of Technology & CNRS

3:30 PM Invited
Development of Synchronized LPSO Microstructures in MgREZn System Examined by SWAXS: *Hiroshi Okuda*[1]; Toshiki Horiuchi[1]; Michiaki Yamazaki[2]; Yoshihito Kawamura[2]; Shinji Kohara[3]; Shigeru Kimura[3]; [1]Kyoto University; [2]Kumamoto University; [3]SPring-8

3:55 PM Break

4:05 PM Invited
Three-dimensional Coherent X-ray Surface Scattering Imaging: *Jin Wang*[1]; Tao Sun[1]; Zhang Jiang[1]; Joseph Strzalka[1]; Leonidas Ocola[2]; [1]X-ray Science Division, Argonne National Laboratory; [2]Center for Nanoscale Materials, Argonne National Laboratory

4:30 PM Invited
Coherent Diffraction Imaging of Strain on the Nanoscale: *Ross Harder*[1]; [1]Argonne National Lab

4:55 PM Invited
The Invar Systems Fe-Pd and Fe-Pt: *Bernd Schoenfeld*[1]; [1]ETH Zurich

5:20 PM
Structure and Composition Determination in Fluctuation X-ray Scattering using Angular Autocorrelation Function as Signature: *Dongsheng Li*[1]; [1]Pacific Northwest National Laboratory

Pb-free Solders and Emerging Interconnect and Packaging Materials — Alloying Additions

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
Program Organizers: Andre Lee, Michigan State University; Fay Hua, Intel Corporation; Tae-Kyu Lee, Cisco; John Elmer, Lawrence Livermore National Laboratory; Yan Li, Intel Corporation; Robert Kao, National Taiwan University; Fan-yi Ouyang, National Tsing Hua University; Chang-Woo Lee, Korea Institute of Industrial Technology; Won Sik Hong, Korea Electronics Technology Institute; Heugel Werner, Bosch Automovitve

Monday PM
February 17, 2014
Room: 5B
Location: San Diego Convention Center

Session Chairs: Tae-Kyu Lee, Cisco Company; Albert Wu, National Central University

2:00 PM
Liquidus Projection of Sn-Ag-Co-Ni Alloys: Sinn-wen Chen[1]; Tung-Kai Chen[1]; Chia-ming Hsu[2]; Jui-shen Chang[1]; *Ssu-ming Tseng*[3]; Kevin Pan[1]; [1]National Tsing Hua University; [2]National United University; [3]National Tsing Hua University

2:20 PM
Effect of Silver Content in SAC Solder on the Interfacial Reaction and Reliability of the angle Joints Fabricated by Laser-jet Soldering: *Hongjun Ji*[1]; Mingyu Li[1]; [1]Harbin Institute of Technology Shenzhen Graduate School

2:40 PM
Effect of the Addition of Neodymium and Praseodymium in Lead-free Solder Tin-silver-bismuth, on the Microstructure and Growth Kinetics of Intermetallic Layer of the Soldered Joints: *Miguel Neri*[1]; Alberto Martinez-Villafañe[1]; Caleb Carreño-Gallardo[1]; [1]CIMAV, S.C.

3:00 PM
Effects of Minor Alloying Element Addition on Ni-Sn Interfacial Reaction under Space Confinement: *Jen-Jui Yu*[1]; Wen-Lin Shih[1]; C. Robert Kao[1]; [1]National Taiwan University

3:20 PM Break

3:40 PM
Nucleation and Growth of $Cu_{33}Al_{17}$ in Al Modified Sn-Ag-Cu and Sn-Cu Pb-free Solder Alloys: *Kathlene Lindley*[1]; Iver Anderson[2]; [1]Purdue University; [2]Ames Laboratory (USDOE)

4:00 PM
Heterogeneous Nucleation of Intermetallics in Pb-free Soldering: *Christopher Gourlay*[1]; Sergey Belyakov[1]; [1]Imperial College London

4:20 PM
Challenges for Scaling of Solder Micro-bump: *Fay Hua*[1]; Yoshihiro Tomita[1]; Eric Li[1]; Raul Mancera[1]; Mike Todd[1]; [1]Intel Corporation

4:40 PM
Synthesis of Tin/Indium (Sn/In) Lead-free Nanosolder Particles and Their Application for Low Temperature Soldering: *Yang Shu*[1]; Karunaharan Rajathurai[1]; Fan Gao[1]; Qingzhou Cui[1]; Zhiyong Gu[1]; [1]University of Massachusetts Lowell

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIII — Phase Equilibria and Transformations of the Pb-free Solders and Energy Materials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee
Program Organizers: Chao-hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Ikuo Ohnuma, Tohoku University; Clemens Schmetterer, Forschungszentrum Juelich, Inst.; Yee-Wen Yen, National Chung Cheng University; Shien Ping Feng, The University of Hong Kong; Shih-Kang Lin, National Cheng Kung University

Monday PM
February 17, 2014
Room: 32A
Location: San Diego Convention Center

Session Chairs: Clemens Schmetterer, Forschungszentrum Juelich, Inst.; Cheng-En Ho, Yuan-Ze University

2:00 PM Invited
CoSb3-InSb Isoplethal Section of Co-Sb-In Ternary Phase Diagram: *Sinn-wen Chen*[1]; Ssu-ming Tseng[1]; Jui-shen Chang[1]; G. Snyder[2]; [1]National Tsing Hua University; [2]California Institute of Technology

2:20 PM Invited
High-temperature Soft Solders: The Ni-Sn-Zn Phase Diagram: *Clemens Schmetterer*[1]; Hans Flandorfer[2]; [1]Forschungszentrum Juelich GmbH; [2]University of Vienna

2:40 PM
The System Cu-Li-Sn: Phase Diagram and Thermochemistry: *Siegfried Fürtauer*[1]; Andriy Yakymovych[1]; Erdenebat Tserenjav[2]; Herbert Ipser[1]; Hans Flandorfer[1]; [1]University of Vienna; [2]National University of Mongolia

3:00 PM
Liquidus Projection of Thermoelectric Ag-Sn-Te Ternary System: *Jui-Shen Chang*[1]; Sinn-wen Chen[1]; Kuo-chun Chiu[1]; Hsin-jay Wu[1]; Jee-jay Chen[1]; [1]National TsingHua University

3:20 PM
Exploring Nature's Missing $Li4Me_5O_{12}$ Defect Spinel Oxides by Ab Initio Calculations: *Ping-chun Tsai*[1]; Shih-kang Lin[1]; Wen-Dung Hsu[1]; [1]National Cheng Kung University (NCKU)

3:40 PM Break

4:00 PM Invited
Interaction of Sn-Sb Based Solders with Nickel: Phase Equilibria in the Ternary Ni-Sb-Sn System: Ales Kroupa[1]; Ratikanta Mishra[2]; Divakar Rajamohan[3]; Hans Flandorfer[3]; Andrew Watson[4]; *Herbert Ipser*[3]; [1]Institute of Physics of Materials; [2]Bhabha Atomic Research Centre; [3]University of Vienna; [4]University of Leeds

4:20 PM Invited
Thermodynamic and Phase Relations of Intermetallic Anode Materials for Li-ion Accumulators: *Hans Flandorfer*[1]; Siegfried Fürtauer[1]; Damian Cupid[2]; Torsten Markus[3]; Herbert Ipser[1]; [1]University of Vienna; [2]Karlsruhe Institute of Technology; [3]Research Center Jülich

4:40 PM Invited
Thermochemical Investigations on Phase Stabilities for Electrode Materials of Advanced Li-ion Batteries: *Torsten Markus*[1]; David Henriques[1]; Marco Prill[1]; Siaufung Dang[1]; Clemens Schmetterer[1]; [1]Forschungszentrum Juelich GmbH

5:00 PM Invited
Thermodynamic Investigation of the Lithium–silicon–oxygen System for Lithium Ion Batteries: *Damian Cupid*[1]; Alexandra Reif[1]; Hans Seifert[1]; [1]Karlsruhe Institute of Technology

Phase Transformation and Microstructural Evolution — Fundamentals of Diffusion in Transformations in Steels

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee
Program Organizers: Amy Clarke, Los Alamos National Laboratory; Sudarsanam Suresh Babu, The Ohio State University; Ning Ma, ExxonMobile Research & Engineering; Tadashi Furuhara, Tohoku University; Frédéric Danoix, Université de Rouen; Mohamed Gouné, University of Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC); Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Vijay Vasudevan, University of Cincinnati; Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory; Chad Sinclair, University of British Columbia

Monday PM
February 17, 2014
Room: 31C
Location: San Diego Convention Center

Session Chairs: Christopher Hutchinson, Monash University; Hatem Zurob, McMaster University

2:00 PM Invited
Re-examination of Thermodynamic Properties of Cementite Using CVM Calculations: *Hiroshi Ohtani*[1]; Satoshi Iikubo[2]; [1]Tohoku University; [2]Kyushu Institute of Technology

2:30 PM Invited
Theoretical Modeling of Precipitation Kinetics in Steels: *Qing Chen*[1]; Kaisheng Wu[2]; Gustaf Sterner[1]; Johan Bratberg[1]; Anders Engström[1]; Paul Mason[2]; [1]Thermo-Calc Software AB; [2]Thermo-Calc Software Inc

3:00 PM Invited
Role of Interstitials on the Diffusion of Substitutional Solutes in Ferrite: *Marcel Sluiter*[1]; [1]TU Delft

3:30 PM Break

3:45 PM
Austenite-ferrite Transformation: A Coarse-graining Monte Carlo Model: *Adeline Maitre*[1]; Renaud Patte[2]; Frederic Danoix[2]; Doug Ivey[1]; Helena Zapolsky[2]; Hani Henein[1]; [1]University of Alberta; [2]Université et INSA de Rouen

4:05 PM Invited
Self-consistent Model for Planar Ferrite Growth in Fe-C-X Alloys: Damon Panahi[1]; Cong Qui[2]; Christopher Hutchinson[2]; Gary Purdy[1]; *Hatem Zurob*[1]; [1]McMaster University; [2]Monash University

4:35 PM Invited
Pearlite Growth and Manganese Partitioning in 9Mn Steel: Maria Aranda[1]; *Carlos Capdevila-Montes*[1]; Michael Miller[2]; Robert Hackenberg[3]; Esteban Urones-Garrote[4]; [1]CENIM-CSIC; [2]ORNL; [3]LANL; [4]CNME

5:05 PM Invited
γ/α Transformation Behaviors in C Composition Gradient Diffusion Couples in the Fe-C-Mn System: *Ikuo Ohnuma*[1]; Takuya Nakagawa[1]; Toshihiro Omori[1]; Kiyohito Ishida[1]; Ryosuke Kainuma[1]; [1]Tohoku University

5:35 PM
Microstructural Aging of a Precipitation Hardened Martensitic Stainless Steel: *Laurent Couturier*[1]; Frederic De Geuser[1]; Alexis Deschamps[1]; Jonathan Hugues[2]; Eric Andrieu[2]; [1]SIMAP - Grenoble INP - UJF - CNRS; [2]CIRIMAT - INP Toulouse

Progress Towards Rational Materials Design in the Three Decades Since the Invention of the Embedded Atom Method: An MPMD Symposium in Honor of Dr. Michael I Baskes — Interatomic Potentials and Applications

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Srinivasan Srivilliputhur, University of North Texas; Amit Misra, Los Alamos National Laboratory; Neville Moody, Sandia National Laboratories; Stephen Foiles, Sandia National Laboratories; Mark Asta, University of California ; Alan Needleman, University of North Texas

Monday PM
February 17, 2014
Room: 30E
Location: San Diego Convention Center

Session Chairs: Murray Daw, Clemson University; Stephen Foiles, Sandia National Laboratories; Susan Sinnott, University of Florida

2:00 PM Invited
Resources for the Selection and Use of Interatomic Potentials in Atomistic Simulations: *Chandler Becker*[1]; Zachary Trautt[1]; [1]NIST

2:20 PM Invited
Development of EAM Potentials Suitable for Simulation of Crystal Defect and Liquid Properties: *Mikhail Mendelev*[1]; [1]Ames Laboratory

2:40 PM
A New Approach for Interatomic Potentials: Application to Tantalum: *Stephen Foiles*[1]; Garritt Tucker[1]; Aidan Thompson[1]; Laura Swiler[1]; Christian Trott[1]; [1]Sandia National Laboratories

3:00 PM
Atomistic Potentials for Palladium-silver Hydrides: Lucas Hale[1]; Bryan Wong[2]; *Jonathan Zimmerman*[1]; Xiaowang Zhou[1]; [1]Sandia National Laboratories; [2]Drexel University

3:20 PM Break

3:30 PM Invited
Embedded Atom Method Insight into the Phase Stability of Alloys: *Marius Stan*[1]; Zhi-Gang Mei[1]; [1]Argonne National Laboratory

3:50 PM Invited
Fitting and Testing of Interatomic Potentials for Modeling Material Behavior in Extreme Environments: *Ramon Ravelo*[1]; [1]University of Texas-El Paso

4:10 PM
Effects of Vacancy on Generalized Stacking Fault Energy of Metals: *Ebrahim Asadi*[1]; Mohsen Asle Zaeem[1]; Amitava Moitra[2]; Mark Tschopp[3]; [1]Missouri University of Science and Technology; [2]S. N. Bose National Centre for Basic Sciences; [3]Army Research Laboratory

4:30 PM
Analytic Bond-order Potentials for Dynamical Simulations: *Thomas Hammerschmidt*[1]; Bernhard Seiser[2]; Miroslav Cak[1]; David G. Pettifor[2]; Ralf Drautz[1]; [1]ICAMS, Ruhr-University Bochum; [2]MML, University of Oxford

4:50 PM
The Environment Dependent Dynamic Charge Potential: *Krishna Muralidharan*[1]; Pierre Deymier[1]; Keith Runge[1]; [1]University of Arizona

5:10 PM Invited
Potentials Energy Surfaces from Atomic-scale Hamiltonians: *Steven Valone*[1]; Ghanshyam Pilania[1]; Xiang-Yang Liu[1]; Kedarnath Kolluri[2]; Michael Baskes[3]; [1]Los Alamos National Laboratory; [2]University of Pennsylvania; [3]University of California San Diego

Rare Metal Extraction & Processing Symposium — Indium, Moly, and Tungsten Metallurgy

Sponsored by: Associação Brasileira de Metalurgia, Materiais e Mineração – ABM, Chinese Society for Metals, Metallurgy and Materials Society of CIM, Institute of Materials, Minerals and Mining, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Neale Neelameggham, Ind LLC; Shafiq Alam, Memorial University of Newfoundland; Harald Oosterhof, Umicore; Animesh Jha, University of Leeds; Shijie Wang, Rio Tinto, Kennecott Utah Copper Refinergy

Monday PM
February 17, 2014
Room: 16B
Location: San Diego Convention Center

Session Chairs: Shijie Wang, Rio Tinto Kennecott Utah Copper Corp; Michael Free, University of Utah

2:00 PM Introductory Comments

2:05 PM
Recovery of Rare Metal Indium (In) from Discarded LCD Monitors: *Pankaj Choubey*[1]; Manis Jha[1]; Jinki Jeong[2]; Jae-chun Lee[2]; [1]CSIR-National Metallurgical Laboratory; [2]Korea Institute of Geoscience and Mineral Resources (KIGAM)

2:25 PM
Thermodynamics of Indium Dissolution Behavior in FeO-bearing Metallurgical Slag: *Yunsoon Han*[1]; Joohyun Park[1]; [1]Hanyang University

2:45 PM
The Separation of Tungsten and Molybdenum by Ion Exchange Resins: Guangsheng Huo[1]; Chao Peng[1]; Chunhua Liao[1]; [1]Central South University

3:05 PM
Removal of Na from the Ammonium Tungstate Solution by Na1+xAlxTi2-x(PO4)3: *Xingyu Chen*[1]; Xuheng Liu[1]; Zhongwei Zhao[1]; Jiangtao Liu[1]; [1]Central South University

3:25 PM Break

3:45 PM
Removal of Sn from the Tungstate Solution by Nascent Hydrous Ferric Oxide: *Zhongwei Zhao*[1]; Xingyu Chen[1]; Xuheng Liu[1]; Jiangtao Liu[1]; [1]Central South University

4:05 PM
Pressure Water Leaching Molybdenum and Nickel from Mo-Ni Ore of Black Shale without Reagent: *Zhigan Deng*[1]; [1]Kunming University of Science and Technology

Solid-state Interfaces III: Toward an Atomistic-scale Understanding of Structure, Properties, and Behavior through Theory and Experiment — Interface Structures, Defects, and Shock Response

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Xiang-Yang Liu, Los Alamos National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Stephen Foiles, Sandia National Laboratories; Mitra Taheri, Drexel University; Rampi Ramprasad, University of Connecticut

Monday PM
February 17, 2014
Room: 6D
Location: San Diego Convention Center

Session Chair: Xiang-Yang (Ben) Liu, Los Alamos National Laboratory

2:00 PM
Spiral Patterns in Dislocation Arrangements at Nodes in (111) Semi-coherent Interfaces in FCC Crystals: *Jian Wang*[1]; Shuai Shao[1]; Amit Misra[1]; Richard Hoagland[1]; [1]Los Alamos National Laboratory

2:20 PM Invited
Radiation Response of Immiscible Ag/Ni Multilayers: *Xinghang Zhang*[1]; K.Y. Yu[1]; Y. Chen[1]; H. Wang[1]; L. Shao[1]; M.A. Kirk[2]; M. Li[2]; [1]Texas A&M University; [2]Argonne National Laboratory

3:00 PM
Realistic Interfaces in Metallic Glass/Crystalline Composites: *Michael Gibbons*[1]; Allen Hunter[2]; David Riegner[1]; Emmanuelle Marquis[2]; Douglas Hofmann[3]; Katharine Flores[4]; Wolfgang Windl[1]; [1]The Ohio State University; [2]University of Michigan; [3]Jet Propulsion Laboratory; [4]Washington University

3:20 PM
Determining the Burgers Vectors and Elastic Strain Energies of Interface Dislocation Arrays Using Anisotropic Elasticity Theory: *Aurélien Vattré*[1]; Michael Demkowicz[2]; [1]CEA; [2]MIT

3:40 PM Break

3:50 PM Invited
Plastic Responses of Copper-lead Bicrystal Interfaces to Shock Loading: *Steven Valone*[1]; Richard Hoagland[1]; Ellen Ceretta[1]; George Gray[1]; Saryu Fensin[1]; [1]Los Alamos National Laboratory

4:30 PM
Ab Initio Study on the Role of Interfaces for Structural Transformations in the Fe-C System: Xie Zhang[1]; *Tilmann Hickel*[1]; Jörg Neugebauer[1]; Jutta Rogal[2]; Ralf Drautz[2]; [1]Max-Planck-Institut fuer Eisenforschung GmbH; [2]Ruhr-Universität Bochum

4:50 PM Invited
Interfaces in Extreme Environments: Modeling across Multiple Scales: *Avinash Dongare*[1]; [1]University of Connecticut

Ultrafine Grained Materials VIII — Special Session: Gradient and Layered Nanostructures

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Suveen Mathaudhu; Yuri Estrin, Monash University; Zenji Horita, Kyushu University; Enrique Lavernia, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuming Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Monday PM
February 17, 2014
Room: 6E
Location: San Diego Convention Center

Session Chairs: Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research

2:00 PM Keynote
Gradient Nanostructures in Materials: *K. Lu*[1]; Yi Li[2]; [1]Chinese Academy of Sciences; [2]Department of Materials Science, National University of Singapore

2:20 PM Invited
Grain Size Gradient-induced Work Hardening and Extraordinary Ductilization: *Xiaolei Wu*[1]; *Yuntian Zhu*[2]; [1]Institute of Mechanics, Chinese Academy of Sciences; [2]North Carolina State University

2:40 PM
Gradient Structure: Perspective, Prospect and Problems: *Yuntian Zhu*[1]; Xiaolei Wu[2]; Ke Lu[3]; [1]North Carolina State University; [2]Chinese Academy of Sciences; [3]Institute of Metal Research

3:00 PM Invited
Interfaces by Design: *Irene Beyerlein*[1]; [1]Los Alamos National Laboratory

3:20 PM Invited
Layered Structures in Deformed Metals and Alloys: *Niels Hansen*[1]; Xiaodan Zhang[1]; Xiaoxu Huang[1]; [1]Technical University of Denmark

3:40 PM Break

3:55 PM Invited
Ni Based Gradient Materials: Y Lin[1]; *Yi Li*[1]; K Lu[1]; [1]Institute of Metal Research