

Table of Contents

	<u>Page #</u>
<i>Preface</i> -----	xvi
<i>Organizing/Advisory Committee</i> -----	xvii
 <i>Process Development</i>	
 A Novel Projection based Electro-Stereolithography (PES) Process for Composite Printing	
<i>Y. Pan^a, A. Patil^a, C. Zhou^b, ^aUniversity of Illinois at Chicago, ^bUniversity at Buffalo</i> -----	1
 Additive Manufacture of Large Structures: Robotic or CNC Systems?	
<i>Y.K. Bandari, S.W. Williams, J. Ding, F. Martina, Cranfield University</i> -----	17
 Active Device Fabrication using Fiber Encapsulation Additive Manufacturing	
<i>M. Saari, M. Galla, B. Cox, E. Richer, P. Krueger, A. Cohen, Southern Methodist University</i> -----	26
 High Viscosity Jetting of Conductive and Dielectric Pastes for Printed Electronics	
<i>J. Ledesma-Fernandez, C. Tuck, R. Hague, University of Nottingham</i> -----	40
 Support-less Horizontal Filament-stacking by Layer-less FDM	
<i>Y. Kanada, Dasyn.com</i> -----	56
 Selective Separation Sintering (SSS) A New Layer Based Additive Manufacturing Approach for Metals and Ceramics	
<i>J. Zhang, B. Khoshnevis, University of Southern California</i> -----	71
 Understanding the Dynamics of Ultrasonic Additive Manufacturing	
<i>Q. Mao^a, N. Coutris^a, J. Gibert^b, G. Fadel^a, ^aClemson University, ^bPurdue University</i> -----	80
 A Review of Hybrid Manufacturing	
<i>K. A. Lorenz^{ab}, J.B. Jones^c, D.I. Wimpenny^a, M.R. Jackson^b, ^aThe Manufacturing Technology Centre, ^bLoughborough University, ^cHybrid Manufacturing Technologies</i> -----	96
 Selective Heat Sintering Versus Laser Sintering: Comparison of Deposition Rate, Process Energy Consumption and Cost Performance	
<i>M. Baumanns, C. Tuck, R. Hague, University of Nottingham</i> -----	109

Solid Freeform Fabrication of Transparent Fused Quartz using a Filament Fed Process <i>J. Luo^a, L.J. Gilbert^a, C. Qu^a, B. Morrow^a, D.A. Bristow^a, R. G. Landers^a, J. Goldstein^b, A. Urbas^b, E.C. Kinzel^a, ^aMissouri University of Science and Technology, ^bAir Force Research Laboratory</i>	122
μ-SLS of Metals: Design of the Powder Spreader, Powder Bed Actuators and Optics for the System <i>N.K. Roy, M.A. Cullinan, The University of Texas at Austin</i>	134
Numerical Simulation and Experimental Investigation of Arc Based Additive Manufacturing Assisted with External Longitudinal Static Magnetic Field <i>X.M. Zhou, H.O. Zhang, G.L. Wang, L.Y. Liang, Y.H. Fu, X W Bai, X.P Wang, Huazhong University of Science and Technology</i>	156
A High Temperature Polymer Selective Laser Sintering Testbed for Controls Research <i>S. Fish^a, S. Kubiak^b, W. Wroe^a, J. Booth^a, A. Bryant^a, J. Beaman^a, ^aThe University of Texas at Austin, ^bStratasys Direct Manufacturing</i>	171
Embedding of SMD Populated Circuits into FDM Printed Objects <i>F. Wasserfall, University of Hamburg</i>	180
Temperature History within Laser Sintered Part Cakes and Its Influence on Process Quality <i>S. Josupeit, H.-J. Schmid, University of Paderborn</i>	190
The Heterogeneous Compensation for the Infiltrative Error of the Binder Jetting Additive Manufacturing Processes <i>X. Ma, F. Lin, L. Zhang, Tsinghua University</i>	200
Study of Infill Print Parameters on Mechanical Strength and Production Cost-Time Of 3D Printed ABS Parts <i>L. Baich, G. Manogharan, Youngstown State University</i>	209
Using Design of Experiments in Finite Element Modeling to Identify Critical Variables for Laser Powder Bed Fusion <i>L. Ma, J. Fong, B. Lane, S. Moylan, J. Filliben, A. Heckert, L. Levine, National Institute of Standards and Technology</i>	219
An Experimental-Numerical Investigation of Heat Transfer during Selective Laser Melting <i>M. Masoomi^a, S. M. Thompson^a, N. Shamsaei^a, A. Elwany^b, L. Bian^a, ^aMississippi State University, ^bTexas A & M University</i>	229

Dynamic Resolution Control in a Laser Projection based Stereolithography System	
<i>Y. Pan, C. Dagli, University of Illinois at Chicago</i> -----	243
Dual Thermographic Monitoring of Ti-6Al-4V Cylinders during Direct Laser Deposition	
<i>G. Marshall^a, W.J. Young II^a, N. Shamsaei^a, J. Craig^{ab}, T. Wakeman^{ab}, S. M. Thompson^a, ^aMississippi State University, ^bStratronics Inc.</i> -----	259
Beyond layer-by-layer Additive Manufacturing – Voxel-wise Directed Energy Deposition	
<i>A.R. Nassar, E.W. Reutzel, The Pennsylvania State University</i> -----	273
Process Monitoring of Directed-Energy Deposition of Inconel-718 via Plume Imaging	
<i>A.R. Nassar, B. Starr, E.W. Reutzel, The Pennsylvania State University</i> -----	284
Optical, Layerwise Monitoring of Powder Bed Fusion	
<i>B.K. Foster, E.W. Reutzel, A.R. Nassar, B.T. Hall, S.W. Brown, C.J. Dickman, The Pennsylvania State University</i> -----	295
Extrusion-Based Additive Manufacturing of the Moisture-Cured Silicone Elastomer	
<i>Y. Jin^{ab}, J. Plott^b, A. J. Shih^b, ^aZhejiang University, ^bThe University of Michigan at Ann Arbor</i> -----	308
Effects of Temperature on Aqueous Freeform Extrusion Fabrication	
<i>J. Li, M.C. Leu, G.E. Hilmas, Missouri University of Science and Technology</i> -----	319
Methods of Extrusion on Demand for High Solids Loading Ceramic Paste in Freeform Extrusion Fabrication	
<i>W. Li, A. Ghazanfari, M.C. Leu, R.G. Landers, Missouri University of Science and Technology</i> -----	332
Effects of Oxygen Inhibition and Post-Processing on Exposure Controlled Projection Lithography Process Accuracy	
<i>Y. Zhang, A. Jariwala, D.W. Rosen, Georgia Institute of Technology</i> -----	346
Position Dependency of Surface Roughness in Parts from Laser Beam Melting Systems	
<i>S. Kleszczynski^a, A. Ladewig^b, K. Friedberger^b, J. zur Jacobsmühlenc^c, D. Merhof^c, G. Witt^a, ^aUniversity of Duisburg-Essen, ^bMTU Aero Engines AG, ^cRWTH Aachen University</i> -----	360

Systematical Determination of Tolerances for Additive Manufacturing by Measuring Linear Dimensions <i>T. Lienenke, G.A.O. Adam, S. Leuders, F. Knoop, S. Josupeit, P. Delfs, N. Funke, D. Zimmer, University of Paderborn</i> -----	371
Exploring Model-Based Engineering Concepts for Additive Manufacturing <i>R.R. Lipman, J.S. McFarlane, National Institute of Standards and Technology</i> -----	385
Toward Better Build Volume Packing in Additive Manufacturing: Classification of Existing Problems and Benchmarks <i>L.J.P. Araújo, E. Özcan, J.A.D. Atkin, M. Baumann, C. Tuck, R. Hague, University of Nottingham</i> -----	401
A Framework for Large Scale Fused Pellet Modeling (FPM) by an Industry Robot <i>Z. Wang, R. Liu, T. Sparks, F. Liou, Missouri University of Science and Technology</i> -----	411
Depth of Cut Monitoring for Hybrid Manufacturing using Acoustic Emission Sensor <i>H. Gaja, F. Liou, Missouri University of Science and Technology</i> -----	422
Design and Optimization of a High Temperature Microheater for Inkjet Deposition <i>A. VanHorn, W. Zhou, University of Arkansas at Fayetteville</i> -----	437
Use of an Alternative Ink in the High Speed Sintering Process <i>L. Fox, A. Ellis, N. Hopkinson, The University of Sheffield</i> -----	456
Towards High-Quality Selective Beam Melting Technologies: Modeling and Experiments of Single Track Formations <i>W. Yan^{ab}, W. Ge^b, J. Smith^a, G. Wagner^a, F. Lin^b, W.K. Liu^a, ^aNorthwestern University, ^bTsinghua University</i> -----	464
Performance Metric for Powder Feeder Systems in Additive Manufacturing <i>V.S. Bitragunta, T. Sparks, F. Liou, Missouri University of Science and Technology</i> -----	473
Feedforward Control for Polymer Laser Sintering Process Using Part Geometry <i>M. Abdelrahman, T.L. Starr, University of Louisville</i> -----	492

Characterization of Bulk to Thin Wall Mechanical Response Transition in Powder Bed AM <i>B. Brown, W. Everhart, J. Dinardo, Department of Energy's National Security Campus</i> -----	501
Mass Finishing of Laser Sintered Parts <i>P. Delfs, Z. Li, H.-J. Schmid, University of Paderborn</i> -----	514
Development of Powder Bed Fusion Additive Manufacturing Test Bed for Enhanced Real-Time Process Control <i>M.L. Vlasea, B. Lane, F. Lopez, S. Mekhontsev, A. Donmez, National Institute of Standards and Technology</i> -----	527
Material Properties of Laser Sintered Polyamide 12 as Function of Build Cycles using Low Refresh Rates <i>S. Josupeit^a, J. Lohm^{ab}, E. Hermann^b, M. Gessler^c, S. Tenbrink^c H.-J. Schmid^a, ^aUniversity of Paderborn, ^bPhoenix Contact Deutschland GmbH, ^cEOS Electro Optical Systems GmbH</i> -----	540
Elevated Region Area Measurement for Quantitative Analysis of Laser Beam Melting Process Stability <i>J. zur Jacobsmühlen^a, S. Kleszczynski^b, G. Witt^b, D. Merhof^a, ^aRWTH Aachen University, ^bUniversity of Duisburg-Essen</i> -----	549
Investigation of Support Structures for Direct Metal Laser Sintering (DMLS) Of In625 Parts <i>Ö. Poyraz, E. Yasa, G. Akbulut, A.Orhangül, S. Pilatin, TUSAS Engine Industries, Inc.</i> -----	560
Thermographic Measurements of the Commercial Laser Powder Bed Fusion Process at NIST <i>B. Lane, S. Moylan, E. Whitenton, L. Ma, National Institute of Standards and Technology</i> -----	575
System Identification and Feedback Control for Directed-Energy, Metal-Based Additive Manufacturing <i>D.M. Seltzer, X. Wang, A.R. Nassar, J.L. Schiano, E.W. Reutzel, The Pennsylvania State University</i> -----	592
Materials	
Functional Gradient Material of Ti-6Al-4V And γ-TiAl Fabricated by Electron Beam Selective Melting <i>W. Ge, F. Lin, C. Guo, Tsinghua University</i> -----	602

Residual Stress in Metal Specimens Produced by Direct Metal Laser Sintering	
<i>I. Yadroitsava, I. Yadroitsev, Central University of Technology</i>	614
Toward Enabling Spatial Control of Ti-6Al-4V Solidification Microstructure in the Electron Beam Melting Process	
<i>S.P. Narra, R. Cunningham, D. Christiansen, J. Beuth, A.D. Rollett, Carnegie Mellon University</i>	626
Microstructural Sensitive Fatigue Modeling of Additively Manufactured Ti-6Al-4V	
<i>A.J. Sterling, B. Torries, N. Shamsaei, S.M. Thompson, S.R. Daniewicz, Mississippi State University</i>	636
Application of a Microstructural Characterization Uncertainty Quantification Framework to Widmanstätten α-Laths in Additive Manufactured Ti-6Al-4V	
<i>G.T. Loughnane^a, S.L. Kuntz^a, N. Klingbeil^a, J.M. Sosa^b, J. Irwin^c, A.R. Nassar^c, E.W. Reutzel^c, ^aWright State University, ^bThe Ohio State University, ^cThe Pennsylvania State University</i>	647
A Microstructure and Hardness Study of Functionally Graded Materials Ti6Al4V/TiC by Laser Metal Deposition	
<i>J. Zhang^a, Y. Zhang^a, F. Liou^a, J.W. Newkirk^a, K.M.B. Taminger^b, W.J. Seufzer^b, ^aMissouri University of Science and Technology, ^bNASA Langley Research Center</i>	664
Surface Modification on a Porous Co-Cr Scaffold Fabricated by Selective Laser Melting for Bone Implant Applications	
<i>C.J. Han, X. Chen, J.W. Tan, Y. Yao, Q.S. Wei, Z. Zhang, Y.S. Shi, Huazhong University of Science and Technology</i>	674
Microstructure and Property of TiB-Reinforced Ti Alloy Composites by Laser Metal Deposition	
<i>Y. Zhang, J. Zhang, F. Liou, J. Newkirk, Missouri University of Science and Technology</i>	683
Direct Laser Deposition of Ti-6Al-4V from Elemental Powder Blends	
<i>L. Yan, X. Chen, W. Li, F. Liou, J. Newkirk, Missouri University of Science and Technology, Rolla</i>	691
Investigation on the Scan Strategy and Property of 316L Stainless Steel-Inconel 718 Functionally Graded Materials Fabricated by Selective Laser Melting	
<i>Y. Zhou, X. Zhou, Q. Teng, Q.S. Wei, Y.S. Shi, Huazhong University of Science and Technology</i>	700

Effect of Post-Processing on the Microstructure and Mechanical Properties of Ultra-Low Carbon Steel Fabricated by Selective Laser Melting <i>B. Almangour, J. M. Yang, University of California Los Angeles</i>	708
Fatigue Behavior of Selective Laser Melted 17-4 PH Stainless Steel <i>A. Yadollahi^a, N. Shamsaei^a, S.M. Thompson^a, A. Elwany^b, L. Bian^a, M. Mahmoudi^b, ^aMississippi State University, ^bTexas A & M University</i>	721
Wear Studies in Binder Jet Additive Manufactured Stainless Steel - Bronze Composite <i>C. Ingenthron, H. Ludwig, T. Joel, K. Agarwal, W. Sealy, Minnesota State University</i>	732
The Effects of Heat Balance on the Void Formation within Marage 300 Processed by Selective Laser Melting <i>T. Burkert^a, A. Fischer^b, ^aBMW Group, ^bUniversity Duisburg-Essen</i>	745
Effect of Bimodal Powder Mixture on Powder Packing Density and Sintered Density in Binder Jetting of Metals <i>Y. Bai, G. Wagner, C.B. Williams, Virginia Tech</i>	758
μ-SLS of Metals: Physical and Thermal Characterization of Cu-nanopowders <i>N.K. Roy, A. Yuksel, M.A. Cullinan, The University of Texas at Austin</i>	772
Laser Metal Deposition of Functionally Gradient Materials from Elemental Copper and Nickel Powders <i>S. Karnati^a, T.E. Sparks^a, F. Liou^a, J.W. Newkirk^a, K.M.B. Taminger^b, W.J. Seufzer^b, ^aMissouri University of Science and Technology, ^bNASA Langley Research Center</i>	789
Processing ODS Modified In625 Using Selective Laser Melting <i>A.B. Spierings^a, T. Bauer^a, K. Dawson^b, A. Colella^c, K. Wegener^a, ^aInspire AG, ^bUniversity of Liverpool, ^cMBN nanomaterialia s.p.a.</i>	803
Microstructure and Mechanical Characterisation of SLM Processed Haynes® 230® <i>T. Bauer^a, K. Dawson^b, A.B. Spierings^a, K. Wegener^a, ^aInspire AG, ^bUniversity of Liverpool</i>	813
Effect of Si on the SLM processability of IN738LC <i>R. Engeli^{ab}, T. Etter^a, F. Geiger^a, A. Stankowski^a, K. Wegener^b, ^aALSTOM (Switzerland) Ltd, ^bETH Zürich</i>	823

In-Situ Thermal Image Correlation with Mechanical Properties of Nylon-12 in SLS <i>W. Wroe, J. Gladstone, T. Phillips, A. McElroy, S. Fish, J. Beaman, The University of Texas at Austin</i>	832
Variability in the Mechanical Properties of Laser Sintered PA-12 Components <i>M. Faes, Y. Wang, P. Lava, D. Moens, KU Leuven</i>	847
Parameter Optimization for Preparing Carbon Fiber/Epoxy Composites by Selective Laser Sintering <i>W. Zhu^a, C. Yan^{ab}, J. Yang^a, S. Wen^a, Y. Shi^a, ^aHuazhong University of Science and Technology, ^bUniversity of Exeter</i>	857
Low Temperature Selective Laser Melting of High Temperature Plastic Powder <i>T. Niino, T. Uehara, The University of Tokyo</i>	866
Study on Inhibition Mechanism of Polymer Parts in Selective Inhibition Sintering Process <i>H. Nouri, B. Khoshnevis, University of Southern California</i>	878
Non-Isotropic Material Distribution Topology Optimization for Fused Deposition Modeling Products <i>R. Hoglund, D.E. Smith, Baylor University</i>	888
Experimental Investigation of Mechanical Properties of 3D-Printing Built Composite Material <i>Y.-T. Kao, T. Dressen, D.S. Kim, S. Ahmadizadeh, B.L. Tai, Texas A&M University</i>	904
Evaluation of 3D Printable Sustainable Composites <i>D.A. Roberson, C.R. Rocha, M. Piñon, The University of Texas at El Paso</i>	914
3D Printing with Natural Fiber Reinforced Filament <i>J.I. Montalvo N, M.A. Hidalgo, Universidad Autonoma de Occidente</i>	922
Mechanical and Thermal Properties of FDM Parts Manufactured with Polyamide 12 <i>F. Knoop, V. Schoepner, University of Paderborn</i>	935
Additive Manufacturing of Soft and Composite Parts from Thermoplastic Elastomers <i>M. Saari, M. Galla, B. Cox, P. Krueger, A. Cohen, E. Richer, Southern Methodist University</i>	949

Characterization of Mutli-Material Interfaces in PolyJet Additive Manufacturing <i>I. Vu, L. Bass, N. Meisel, B. Orler, C.B. Williams, D.A. Dillard, Virginia Tech</i>	959
The Effect of Build Orientation on the Mechanical Properties in Inkjet 3D Printing <i>J. Mueller, K. Shea, ETH Zurich</i>	983
Exploring Variability in Material Properties of Multi-Material Jetting Parts <i>L.B. Bass, N.A. Meisel, C.B. Williams, Virginia Tech</i>	993
Thermal Treatments of AlSi10Mg Processed by Laser Beam Melting <i>A. Mertens^a, O. Dedry^a, D. Reuter^b, O. Rigo^b, J. Lecomte-Beckers^a, ^aUniversity of Liege, ^bSirris Research Center</i>	1007
Fatigue Performance Enhancement of Selectively Laser Melted Aluminium Alloy by Heat Treatment <i>I. Maskery, N.T. Aboulkhair, C. Tuck, R.D. Wildman, I.A. Ashcroft, N.M. Everitt, R.J.M. Hague, University of Nottingham,</i>	1017
Mechanical Properties of Selective Laser Melted AlSi10Mg: Nano, Micro, and Macro Properties <i>N.T. Aboulkhair, A. Stephens, I. Maskery, C. Tuck, I. Ashcroft, N.M. Everitt, University of Nottingham,</i>	1026
Fabrication of 3D Polymer-Metal Nano-Composites in a Single Step by Two-Photon Induced Polymerisation and Metal Salt Reduction <i>Q. Hu, Y. Liu, Y. He, F. Zhang, R. Wildman, C. Tuck, R. Hague, University of Nottingham</i>	1036
Selective Laser Melting of a Bismuth Telluride Thermoelectric Materials <i>A. El-Desouky, A.L. Read, P.M. Bardet, M. Andre, S. LeBlanc, George Washington University</i>	1043
Modeling	
Improving Volumetric Accuracy of AM Parts using Adaptive Slicing of Octree Based Structure <i>S.K. Malyala, A. Manmadhachary, R. Kumar Y, National Institute of Technology Warangal</i>	1051

Multi-Direction Slicing of STL Models for Robotic Wire-Feed Additive Manufacturing <i>D. Ding, Z. Pan, D. Cuiuri, H. Li, N. Larkin, S. van Duin, University of Wollongong</i> -----	1059
Quantifying Mechanical Property Degradation of Cellular Material using As-Fabricated Voxel Modeling for the Material Extrusion Process <i>S.-I. Park, D.W Rosen, Georgia Institute of Technology</i> -----	1070
FE-Optimization and Data Handling for Additive Manufacturing of Structural Parts <i>T. Reiher, R. Koch, University of Paderborn</i> -----	1092
Selective Laser Sintering of Diamond Lattice Structures: Experimental Results and FEA Model Comparison <i>C. Neffa^a, N. Hopkinson^b, N.B. Crane^a, ^aUniversity of South Florida, ^bUniversity of Sheffield</i> -----	1104
Modeling of Powder Bed Processing – A Review <i>A. Flood, F. Liou, Missouri University of Science and Technology</i> -----	1118
Parameter Determination and Experimental Validation of a Wire Feed Additive Manufacturing Model <i>K.S. Kumar, T.E. Sparks, F. Liou, Missouri University of Science and Technology</i> -----	1129
Mesosopic Simulation of Heat Transfer and Fluid Flow in Laser Powder Bed Additive Manufacturing <i>Y.S. Lee, W. Zhang, The Ohio State University</i> -----	1154
A Temperature-Thread Multiscale Modeling Approach for Efficient Prediction of Part Distortion by Selective Laser Melting <i>C. Li^a, J.F. Liu^a, Y.B. Guo^a, Z.Y. Li^b, ^aThe University of Alabama, ^bShandong University of Technology</i> -----	1166
Melt Pool Evolution Study in Selective Laser Melting <i>B. Cheng, K. Chou, The University of Alabama</i> -----	1182
Process Mapping of Inconel 625 in Laser Powder Bed Additive Manufacturing <i>C. Montgomery^a, J. Beuth^a, L. Sheridan^b, Nathan Klingbeil^b, ^aCarnegie Mellon University, ^bWright State University</i> -----	1195

Prediction of Porosity in SLM Parts using a Mars Statistical Model and Bayesian Inference	
<i>G. Tapia, A.H. Elwany, Texas A&M University</i> -----	1205
Effect of Extrudate Swell, Nozzle Shape, and Convergence Zone on Fiber Orientation in Fused Deposition Modeling Nozzle Flow	
<i>B.P. Heller, D.E. Smith, D.A. Jack, Baylor University</i> -----	1220
Modeling and Characterization of Microstructure Evolution in Single-Crystal Superalloys Processed through Scanning Laser Epitaxy	
<i>A. Basak, R. Acharya, S. Das, Georgia Institute of Technology</i> -----	1237
Lattice Boltzmann Simulation of Multiple Droplet Interaction on Non-ideal Surfaces for Inkjet Deposition	
<i>W. Zhou, University of Arkansas at Fayetteville</i> -----	1248
Computational Modeling and Experimental Validation of Melting and Solidification in Equiaxed Superalloys Processed through Scanning Laser Epitaxy	
<i>A. Basak, R. Acharya, R. Bansal, S. Das, Georgia Institute of Technology</i> -----	1264
Inkjet Printing at Megahertz Frequency	
<i>J.C. Miers, W. Zhou, University of Arkansas at Fayetteville</i> -----	1275
Parameter Estimation Based Real-Time Metrology for Exposure Controlled Projection Lithography	
<i>X. Zhao, D.W. Rosen, Georgia Institute of Technology</i> -----	1294
Planning Freeform Extrusion Fabrication Processes with Consideration of Horizontal Staircase Effect	
<i>A. Ghazanfari, W. Li, M.C. Leu, R.G. Landers, Missouri University of Science and Technology</i> -----	1313
Optimal Rastering Orientation in Freeform Extrusion Fabrication Processes	
<i>A. Ghazanfari, W. Li, M.C. Leu, R.G. Landers, Missouri University of Science and Technology</i> -----	1324
Surface Roughness Optimized Alignment of Parts for Additive Manufacturing Processes	
<i>P. Delfs, M. Töws, H.-J. Schmid, University of Paderborn</i> -----	1334

DC-Gain Layer-to-Layer Stability Criterion in Laser Metal Deposition Processes <i>P.M. Sammons, D.A. Bristow, R.G. Landers, Missouri University of Science and Technology</i> -----	1345
An Algorithm-Based Method for Process-Specific Three Dimensional Nesting for Additive Manufacturing Processes <i>A. Arndt, H. Hackbusch, R. Anderl, Technische Universität Darmstadt</i> -----	1356
Applications	
Integration of Topology Optimization with Efficient Design of Additive Manufactured Cellular Structures <i>L. Cheng^a, P. Zhang^a, E. Biyikli^a, J. Bai^a, S. Pilz^b, A.C. To^a, ^aUniversity of Pittsburgh, ^bANSYS, Inc.</i> -----	1370
Lattice-skin Structures Design with Orientation Optimization <i>Y. Tang, Y.F. Zhao, McGill University</i> -----	1378
Shear Properties of the Re-entrant Auxetic Structure Made via Electron Beam Melting <i>L. Yang^a, O. Harrysson^b, H. West^b, D. Cormier^c, ^aUniversity of Louisville, ^bNorth Carolina State University, ^cRochester Institute of Technology</i> -----	1394
Property Evaluation of Metal Cellular Strut Structures via Powder Bed Fusion AM <i>S. Zhang^a, S. Dilip, L. Yang^a, H. Miyanaji^a, B. Stucker^{ab}, ^aUniversity of Louisville, ^b3DSIM</i> -----	1410
Mechanical Impact Performance of Additively Manufactured Negative Stiffness Honeycombs <i>D. Correa, K. Bostwick, P.S. Wilson, M. Haberman, C.C. Seepersad, The University of Texas at Austin</i> -----	1422
Fabrication of Cellular Cordierite Preforms via Binder Jetting <i>D. Snelling, C.B. Williams, C. Suchicital, A. Druschitz, Virginia Tech</i> -----	1434
Design Rules with Modularity for Additive Manufacturing <i>H. Jee^{ab}, Y. Lu^b, P. Witherell^b, ^aHong Ik University, ^bNational Institute of Standards and Technology</i> -----	1450
Residual Stress in Metal Parts Produced by Powder-Bed Additive Manufacturing Processes <i>X. Wang, K. Chou, The University of Alabama</i> -----	1463

Non-Destructive Evaluation of Additively Manufactured Parts via Impedance-Based Monitoring <i>M. Albakri, L. Sturm, C.B. Williams, P. Tarazaga, Virginia Tech</i>	1475
Geometric Element Test Targets for Visual Inference of a Printer's Dimension Limitations <i>S. Chang, H. Li, N. Ostrout, M. Jhuria. S.A. Mottal, F. Sigg, Rochester Institute of Technology</i>	1491
Additive Manufacturing Round Robin Protocols: A Pilot Study <i>S. Moylan^a, J. Land^b, A. Possolo^a, ^aNational Institute of Standards and Technology, ^bUniversity of Maryland College Park</i>	1504
3D-inkjet Printing of Flexible and Stretchable Electronics <i>J. Vaithilingam, E. Saleh, C. Tuck, R. Wildman, I. Ashcroft, R. Hague, P. Dickens, University of Nottingham</i>	1513
Design of Passive Dynamic Walking Robots for Additive Manufacture <i>F. Modica, F.R. Stöckli, K. Shea, ETH Zürich</i>	1527
4D Printing of Soft Robotic Facial Muscles <i>J. Cai, A. Vanhorn, C. Mullikin, J. Stabach, Z. Alderman, W. Zhou, University of Arkansas at Fayetteville</i>	1537
3D Inkjet Printing of Conductive Structures using <i>in-situ</i> IR Sintering <i>E. Saleh, J. Vaithilingam, C. Tuck, R. Wildman, I. Ashcroft, R. Hague, P. Dickens, University of Nottingham</i>	1554
Development of an Economic Decision Support for the Application of Additive Manufacturing in Aerospace <i>G. Deppe, C. Lindemann, R. Koch, University of Paderborn</i>	1560
Feasibility Study of Small Scale Production Based on Additive Manufacturing Technologies <i>M.W.M. Cunico^{abc}, J. de Carvalho^a, ^aUniversidade de São Paulo Campus São Carlos, ^bConcep3d Pesquisas Científicas, ^cPontificia Universidade Católica do Paraná</i>	1570
Polymer Recycling and Additive Manufacturing in an Open Source Context: Optimization of Processes and Methods <i>F. Cruz, S. Lanza, H. Boudaoud, S. Hoppe, M. Camargo, Université de Lorraine</i>	1591

Protection Measures Against Product Piracy and Application by the Use of AM	
<i>U. Jahnke, J. Büsching, T. Reiher, R. Koch, The University of Paderborn</i>	1601
A Glance at the Recent Additive Manufacturing Research and Development in China	
<i>X. Xing^a, L. Yang^b, ^aHarbin Engineering University, ^bUniversity of Louisville</i>	1612
In situ Printing – An Alternative Three Dimensional Laden Structure Fabrication Method	
<i>Y. Liu^a, W. Sun^{abcd}, ^aDrexel University, ^bTsinghua University, ^cBiomanufacturing and Rapid Forming Technology Key Laboratory of Beijing, ^dBiomanufacturing Engineering Laboratory</i>	1635
Inkjet Printing of Materials with Resistance to Bacterial Attachment	
<i>B. Begines, A.L. Hook, R.D. Wildman, C.J. Tuck, M.R. Alexander, University of Nottingham</i>	1652
Optimal Process Parameters for 3D Printing of Dental Porcelain Structures	
<i>H. Miyajima, S. Zhang, A. Lassell, A.A. Zandinejad, L. Yang, University of Louisville</i>	1659
Polymer Particle Formation using Inkjet Printing	
<i>A. Hüsler, R.D. Wildman, M.R. Alexander, University of Nottingham</i>	1679
Freeform Extrusion Fabrication of Titanium Fiber Reinforced Bioactive Glass Scaffolds	
<i>A. Thomas, K.C.R. Kolan, M.C. Leu, G.E. Hilmas, Missouri University of Science and Technology</i>	1688
Improving Energy Efficiency of Car Climate Control with SLS	
<i>M. Vetterli^a, R. Schmid^b, M. Schmid^b, S. Harke^c, T. Durand^d, K. Wegener^a, ^aETHZ, ^binspire AG, ^cWeidPlas GmbH, ^dAutomotive Powertrain Technologies Laboratory EMPA</i>	1700
Study of Vapourised Solvent Attack on Additive Manufacturing Part Surface	
<i>M.W.M. Cunico^{abc}, M.M. Cunico^b, J. de Carvalho^a, ^aUniversidade de São Paulo Campus São Carlos, ^bConcep3d Pesquisas Científicas, ^cPontifícia Universidade Católica do Paraná</i>	1709

Thermal Performance and Surface Characterization of a Selective Laser Melted Flat-Plate Oscillating Heat Pipe <i>J.G. Monroe^a, O.T. Ibrahim^a, S.M. Thompson^{ab}, N. Shamsaei^{ab}, L. Bian^a, A. Elwany^c, ^aMississippi State University, ^bCenter for Advanced Vehicular Systems, ^cTexas A&M University</i>	1719
Further Study of the Electropolishing of Ti6Al4V Parts Made via Electron Beam Melting <i>L. Yang, A. Lassell, G.P.V. Paiva, University of Louisville</i>	1730
Thermal Aspects of Selective Laser Sintering of PMMA+β-TCP Composites <i>R. Velu, S. Singamneni, AUT University</i>	1738
Direct Selective Laser Sintering of Reaction Bonded Silicon Carbide <i>S. Meyers, J.-P. Kruth, J. Vleugels, KU Leuven</i>	1750
Construction by Contour Crafting using Sulfur Concrete with Planetary Applications <i>B. Khoshnevis, X. Yuan, B. Zahiri, B. Xia, University of Southern California</i>	1759
Creating Embedded Radiofrequency Structures using Polyjet Material Jetting <i>R.L. Dumene, P. Kennedy, C.B. Williams, D. Sweeney, G. Earle, Virginia Tech</i>	1769
Capillary-Driven Flow in Open Microchannels Printed with Fused Deposition Modeling <i>R.K. Lade Jr.^a, E.J. Hippchen^a, L. Rodgers^b, C.W. Macosko^a, L.F. Francis^a, ^aUniversity of Minnesota, ^bStratasys Ltd.</i>	1788
Experimental Study of Snap-Fits using Additive Manufacturing <i>K. Torossian^a, D. Bourell^b, ^aNational Engineering School of Saint-Etienne, ^bThe University of Texas at Austin</i>	1794
Author/Attendee List	1804