KY NANOTECHNOLOGY AND ADDITIVE MANUFACTURING SYMPOSIUM

"Strengthening Industry Collaborations with Academia"

Louisville, KY 2018

Symposium Electronic Proceedings

Oral Presentation Abstracts Additive Manufacturing and 3D Printing – Part 1

Melt pool analysis and meso-scale simulation of laser powder bed fusion process with Ti-6Al-4V powder particles

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Net-shape ambient temperature metal additive manufacturing using acoustic energy

Anagh Deshpande1, Keng Hsu1

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Open-Architecture Metals Additive Manufacturing: An Emerging Disruptive Influence on an Already Disruptive Technology

Dr. John Middendorf, Dr. Olga Ivanova, and Dr. Ty Pollak

Universal Technology Corporation, Dayton, OH

Increasing the piezoelectric responses of Polyvinylidene fluoride additively manufactured components

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Oral Presentation Abstracts Academic Interactions with Industry

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The Benefits of University/Industry Partnerships

John Gant, *University of Louisville, Director Industry Partnerships*

Commercialization Opportunities with the University of Louisville

T. Allen Morris1

1Office of Technology Transfer, University of Louisville

Cooperative Education: Developing Your Engineering Talent Pool

Mary Andrade, *University of Louisville, Associate Director, Engineering Career Development & Cooperative Education*

Capstone Opportunities for Industry

Erica Gabbard, *University of Louisville, J.B. Speed School of Engineering, Director of Co-Op Partnership & Industry Engagement*

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Oral Presentation Abstracts Nanotechnology

Microfabrication and Characterization of AlGaAs/GaAs Heterojunction Bipolar Transistors (HBTs)

Qingzhou Xu
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Characterization of Novel Microreactors for Breath Analysis

Qi Li, Zhenzhen Xie, and Xiao-An Fu
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Characterization of Self-Assembled Nanostructures from Evaporated Drops of Bourbon Whiskey

Stuart J. Williams1, Sabina Islam2, Mohamed Z.A. Rashed1, and Orlin Velev2
1Mechanical Engineering, University of Louisville, Louisville, KY
2Chemical Engineering, North Carolina State University, Raleigh, NC

Understanding the Photophysics, Synthesis, and Doping Effects of Graphene Quantum Dots Rosemary

Calabro1, Dong-Sheng Yang1, Doo Young Kim1.
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Oral Presentation Abstracts Accessing University-Affiliated Research Facilities – Part 1

The NSF NNCI KY Multiscale Manufacturing Site – Open for Business

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An Overview of the Micro/Nano Technology Center

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Rapid Prototyping Center/Additive Manufacturing Training Center

Tim Gornet, *Manager Rapid Prototyping Center, University of Louisville*

Conn Center for Renewable Energy Research

Thad Druffel1
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Oral Presentation Abstracts Micro-Electro Mechanical Systems (MEMS)

A Microfabricated Electrochemical Sensor for Continuous, On-site Analysis of Arsenic in Water

Kelsey L. Kaht1, Mark M. Crain2, Thomas J. Roussel2, Robert S. Keynton2, Richard P. Baldwin1
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Wireless Incontinence Monitoring System for Improved Heath

Saliya Kirigeeganage1, Doug Jackson1, John Naber1, Ken Heyl2
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Dimensional dependence of X-ray radiation damage in MEMS devices

Pranoy Deb Shuvra1, Shamus McNamara1, Ji-Tzuoh Lin1, Bruce Alphenaar1, Kevin Walsh1, Jim Davidson2, Michael Alles2, Charles N Arutt2
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Reduced-Order Dynamical Models for Microrobots Driven By Laser Light

Zhong Yang, Indika Wijayasinghe, Andriy Sherehiy, Cindy Harnett, Dan O. Popa
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Oral Presentation Abstracts Accessing University-Affiliated Research Facilities – Part 2

The University of Kentucky Center for Nanoscale Science and Engineering (CeNSE)
J. Todd Hastings
University of Kentucky, Lexington, KY

The University of Kentucky Electron Microscopy Center (EMC)
T. John Balk
University of Kentucky, Lexington, KY

Partnering to Develop Healthcare Technology Solutions that Improve the Lives of the Aging Population
Pamela Adams, *DVP of Enterprise Systems and member of Kindred's Information Systems Executive Leadership Team*

FirstBuild, GE Appliances' Co-Creation Community
Larry Portaro
Director, FirstBuild

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Oral Presentation Abstracts Additive Manufacturing and 3D Printing – Part 2

Materials and Process Design for Metal Fused Filament Fabrication (MF3)

Paramjot Singh1, Sundar Atre1 and Kunal Kate1*

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Embedding Sensing Capabilities in an FDM-Printed Object

Garrett McGrady, Neel Jain, Douglas Jackson, Dr. Kevin Walsh

Electrical & Computer Engineering, University of Louisville

Exploring structural metamaterials: From single to multiple scales

Li Yang1

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Mechanistic insights of the acid-catalyzed synthesis of diphenolic acid as a plastic precursor for 3D printing applications

Md. Shahin Rahaman and Noppadon Sathitsuksanoh

Department of Chemical Engineering, University of Louisville

Vat Photopolymerization of All-aromatic Polyimides

Jana Herzberger1, Viswanath Meenakshisundaram2, Christopher B. Williams2, Timothy E. Long3

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2Department of Mechanical Engineering and Macromolecules and Innovation Institute, Virginia Tech

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Oral Presentation Abstracts Bioengineering and Life Sciences

An Ultrasound-Integrated Microfluidic Platform to Enhance Intracellular Molecular Delivery

Caroline M. Stivers1, Marie S. Burns1, Emily M. Murphy1, Mariah C. Priddy1, Jonathan A. Kopechek1
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Fast Nanoscale Imaging of Live Cells Using an Adaptive Hopping Probe Ion Conductance Microscope

A. Catalina Vélez-Ortega1, Carolina Galeano-Naranjo1, Gregory I. Frolenkov1
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Structural and Functional Characterization of ATP nanoliposomes with potential for accelerating delayed diabetic wound healing and injured spinal cord regeneration

Girish J. Kotwal1, Michael Martin1 and Sufan Chien1,2
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BAR-Encapsulated Nanoparticles against *P. gingivalis* Biofilm Formation

Mohamed Y. Mahmoud1, 4, Donald R. Demuth3, and Jill M. Steinbach-Rankins1, 2, 4
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Ultrasound-enhanced Molecular Delivery to Red Blood Cells in a Microfluidic System for Dry Storage

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Oral Presentation Abstracts Opportunities for Industry

Manufacturing Economic Growth
Scott Herrmann
Director, Louisville Forward Economic Development

Workforce Education and Training for production of Additive Metals
Edward C Tackett

Additive Manufacturing and its Economic Impact on Kentucky
Eric Wooldridge, PE, RA
Somerset Community College, KCTCS

Louisville's Entrepreneurial Resources
Lisa Bajorinas, VP Entrepreneurship & Talent,
Executive Director of EnterpriseCorp, Greater Louisville Inc.

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Oral Presentation Abstracts Processing and Fabrication – Part 1

Laser-assisted micro-patterning on NiTi shape memory alloys

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Ion Channels Reconstituted in Synthetic Block Copolymers

Michael D. Martin, Joel Fried, Farnaz Minooei, J. Patrick Brian, and Timothy Dubbs
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Amphiphilic Janus Gold Nanoplates for Supramolecular Assembly

Md. Emtias Chowdhury 1, Martin O'Toole 2
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2Departmenmt of Chemistry, University of Louisville

Roll-to-roll fabrication of solar cells through process and chemistry engineering

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Oral Presentation Abstracts Processing and Fabrication – Part 2

Rapid Photonic Processing of Films in Roll-to-Roll Applications

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Electron-beam induced deposition and etching using liquids: A path to nanoscale rapid prototyping with functional materials

Samaneh Esfandiarpour, Sarah Lami, Gabriel Smith, Cary Brown, and J. Todd Hastings

Electrical and Computer Engineering, University of Kentucky, Lexington, KY

Laser Metals Additive Manufacturing Process Simulation Software Landscape

Timothy Gornet*, Manager Rapid Prototyping Center, University of Louisville*

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Oral Presentation Abstracts Energy

New Liquid Synthesis Of Solid-State Electrolytes For The Next Generation Batteries

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2 Mechanical Engineering Department, University of Louisville, USA
3 Chemical Engineering Department, University of Louisville, USA

Novel bio-derived solvents for biofuels production

Md. Anwar Hossain and Noppadon Sathitsuksanoh
Department of Chemical Engineering, University of Louisville

Advanced Materials and Processes for Addressing Renewable Energy Challenges

Professor Mahendra K. Sunkara
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