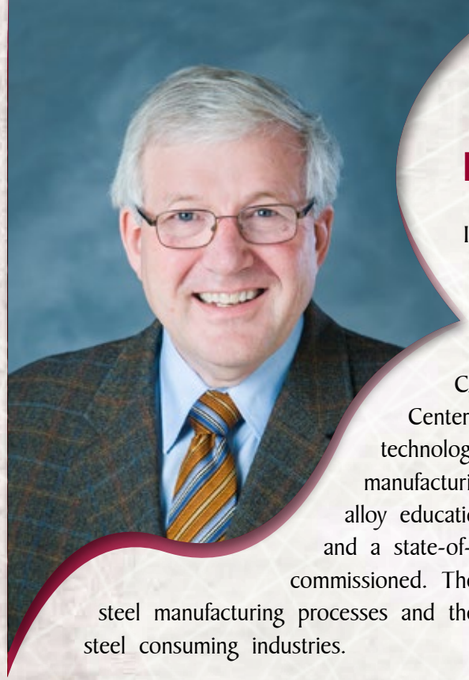
Annual Report 2013

CAVS

Center for Advanced Vehicular Systems

MISSISSIPPI STATE UNIVERSITY

JAMES WORTH BAGLEY COLLEGE OF ENGINEERING
MISSISSIPPI STATE UNIVERSITY



DIRECTOR'S *Message*

In 2013, CAVS faculty and staff has several notable achievements I would like to highlight. In our goal to be a world-class center of excellence we expanded on two partnerships with global implications and established one new one.

CAVS and Severstal North America (SNA) launched the Steel Research Center (SRC) at MSU to establish and operate a world-class steelmaking technology hub. The partnership is expected to help grow the region's high-tech manufacturing economy and foster national and international participation in ferrous alloy education and development. SNA has contributed funds to support the SRC and a state-of-the-art melting furnace with vacuum capability was purchased and commissioned. The SRC will help drive advanced predictive capabilities focusing on steel manufacturing processes and the design of new alloys for key flat rolled products to support the steel consuming industries.

Research activities conducted under the auspices of the KITECH-CAVS Center for Root Technologies were initiated with several South Korean researchers coming to CAVS to work as part of joint research teams. The Korea Institute of Industrial Technology (KITECH) is a South Korean government organization that serves as a research and development resource for small and medium enterprises. The Center for Root Technologies has a focus on several "Root technologies" critical to the manufacturing industry -- casting, molding, forming, surface treatment, thermal treatment, and welding/joining technologies. The alliance will allow CAVS and KITECH to support global manufacturers' efforts to develop products and train employees for their facilities in the southeastern United States.

CAVS is also continuing to be a leading economic development engine for the State of Mississippi. The CAVS facility served as the focal point for meetings during the recruitment of Yokohama Tire Corporation to West Point, Mississippi. CAVS researchers have also visited the Yokohama Tire Corporation in Tokyo to initiate discussions on how CAVS can support the engineering and manufacturing needs of their West Point facility once it is in production.

CAVS has also focused this year on strengthening its partnership with the U.S. Army Engineer Research and Development Center (ERDC) in Vicksburg. Leveraging from the center's long history of high performance computing research activities and multiple research projects with DoD, NASA, and DOE, CAVS has initiated research to support ERDC's High Performance Computing Modernization Program.

Next year holds much promise for CAVS as several of these new initiatives begin to mature.

The Center for Advanced Vehicular Systems (CAVS) at

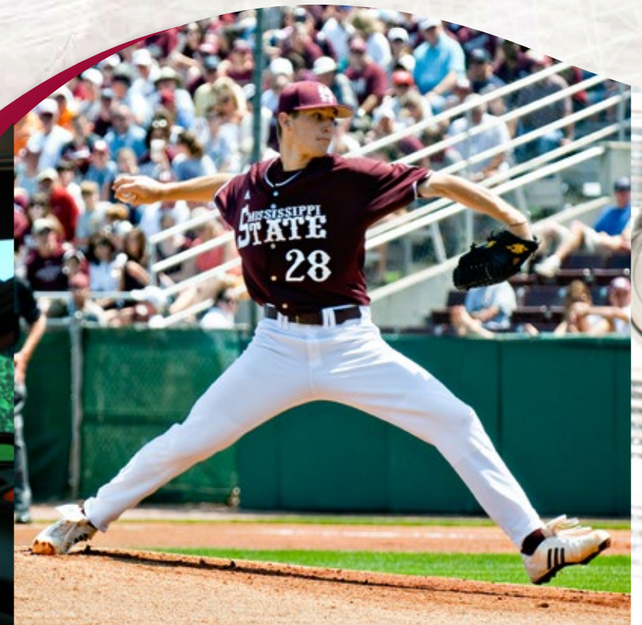
Mississippi State University is an interdisciplinary center comprised of research, engineering design & development, and technology transfer teams for industry and government partners. Our overall effort is focused on developing superior computational, engineering, manufacturing, design, and information technologies relevant to Mississippi and regional industries. This is accomplished by bringing to bear world-class technologist and technologies to solve complex problems. The research output provides sustainable regional competitive advantages. To be successful, CAVS maintains a portfolio of short-term and long-term projects to create a succession of increasingly more vital outputs, ranging from students with enhanced project management skills to commercialization of the intellectual products. The Center for Advanced Vehicular Systems at the HPC2 now serves as the focus for the Bagley College of Engineering's high performance computing activities that has been a longtime strength of the college. CAVS also is the home of the college's Computational Engineering graduate degree program.

VISION

The Center for Advanced Vehicular Systems (CAVS) will be a global leader in interdisciplinary education and research for the development of engineering solutions that expand and enhance the design, technology, production, and infrastructure necessary for sustainable mobility.

MISSION

CAVS strives to be a world-class center of excellence for research, technology and education equipped to address engineering challenges facing US mobility industries. Utilizing high performance computational resources and state-of-the-art analytical tools for modeling, simulation, and experimentation, CAVS will provide a distinctive, interdisciplinary environment wherein next-generation engineers and scientists train alongside field experts to investigate, design, and verify novel solutions in materials, propulsion, and design for efficient human and vehicle mobility. Harnessing our broad impact research along with our state, national, and international industrial alliances, CAVS will support economic development and outreach activities throughout the State of Mississippi.



RESEARCH: *Humans and Interfaces*

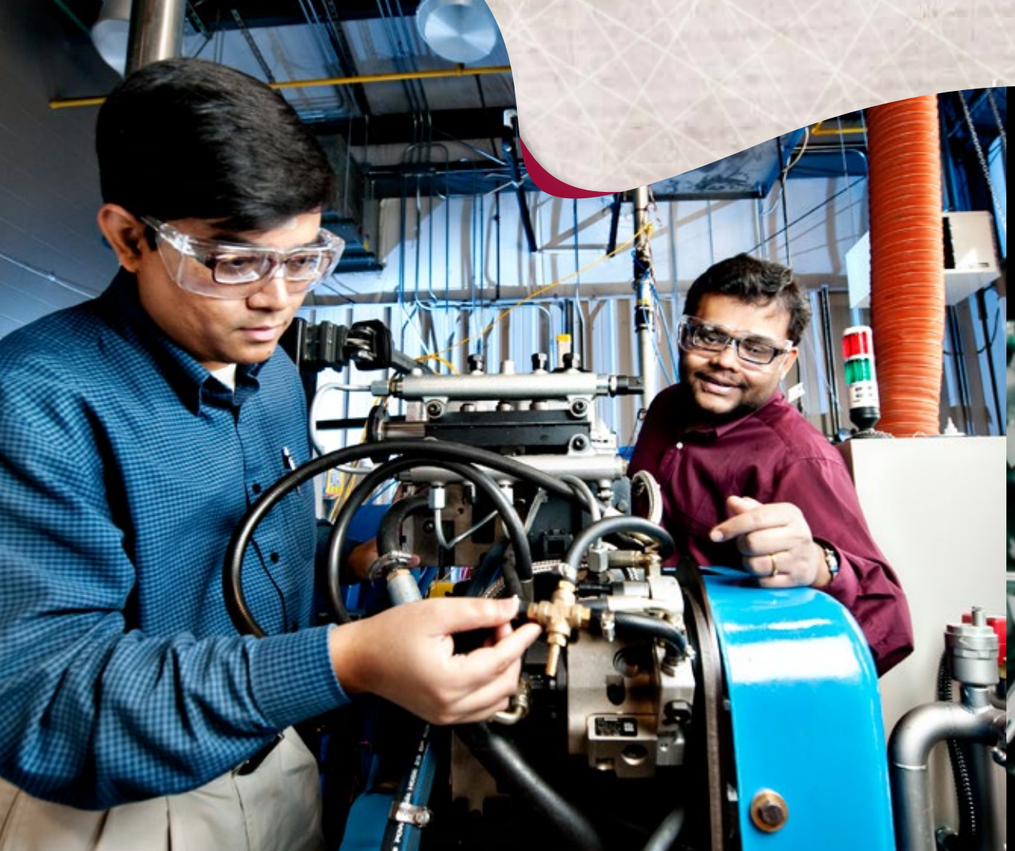
What began as research into driver response has expanded over the years to a multidisciplinary research effort looking into physical and cognitive aspects of human performance in health, safety, and ergonomics. This multidisciplinary study enlists the expertise of researchers in the fields of human factors, ergonomics, cognitive science, kinesiology, physiology, biomedical engineering, virtual environments, and digital human modeling. CAVS boasts a wide array of research areas such as:

- Human-Robot Interaction
- Driver Behavior and Performance
- Augmented and Virtual Reality
- Sports Performance
- Occupational Ergonomics
- Law Enforcement

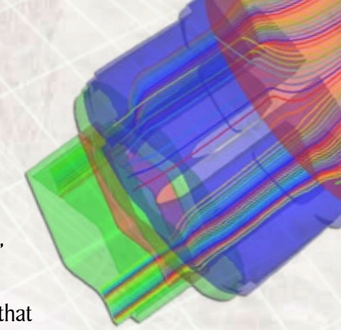
RESEARCH: *Power and Energy*

One of the greatest concerns for modern times is the topic of environmental sustainability. At CAVS, researchers continue to develop leading edge technologies that improve mobility, reliability, and safety, while paving the way for higher fuel efficiency and reducing the carbon footprint for future vehicle generations. To achieve this goal CAVS utilizes their state-of-the-art facilities to advance research of engine technologies, duel fuel utilization, hybrid vehicle components, and biofuels. The specific research areas include:

- EcoCAR
- Challenge X
- Automotive Electronics
- Hybrid Technologies
- IC Engines
- Noise, Vibration, and Harshness
- Emissions

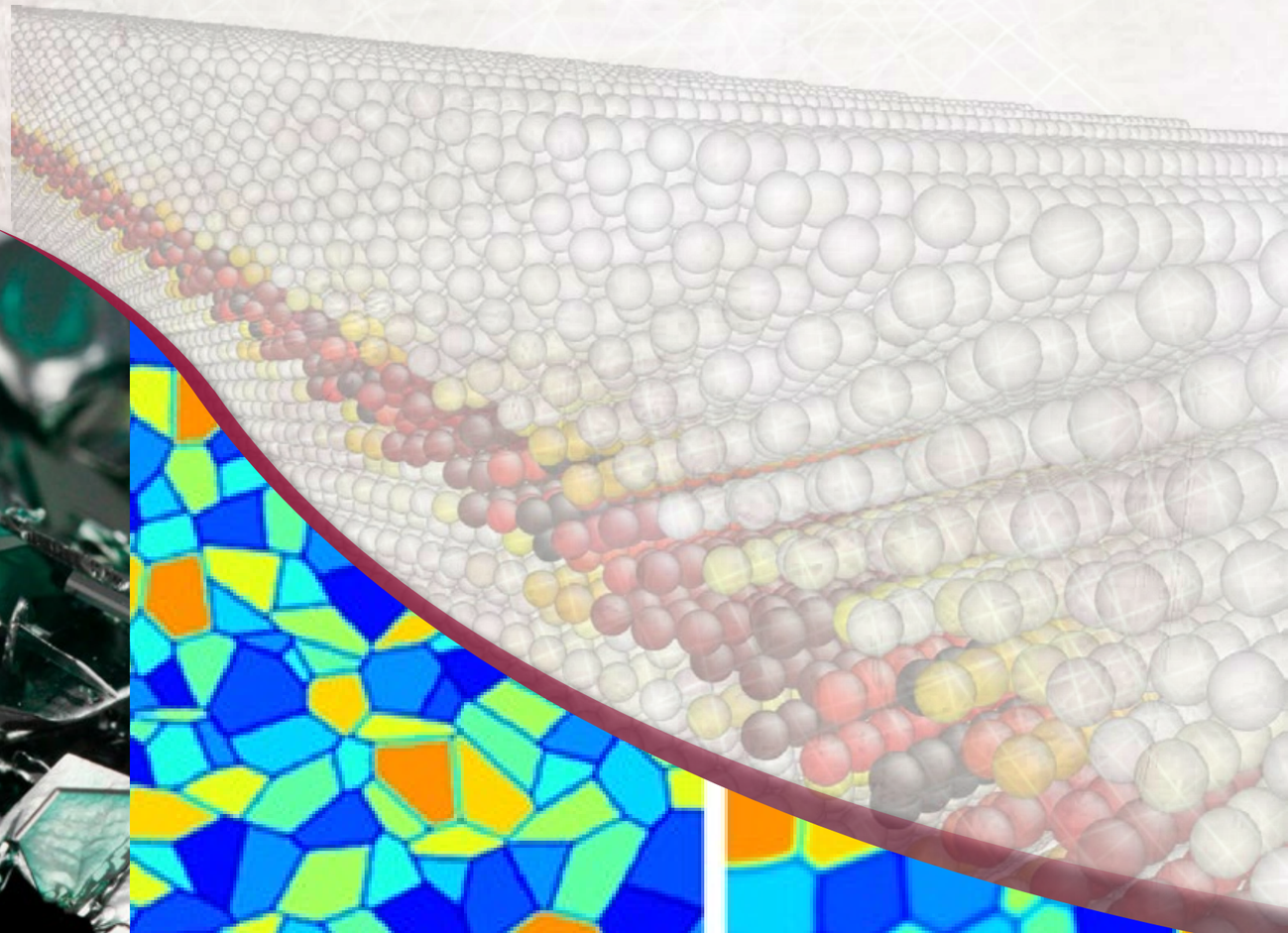


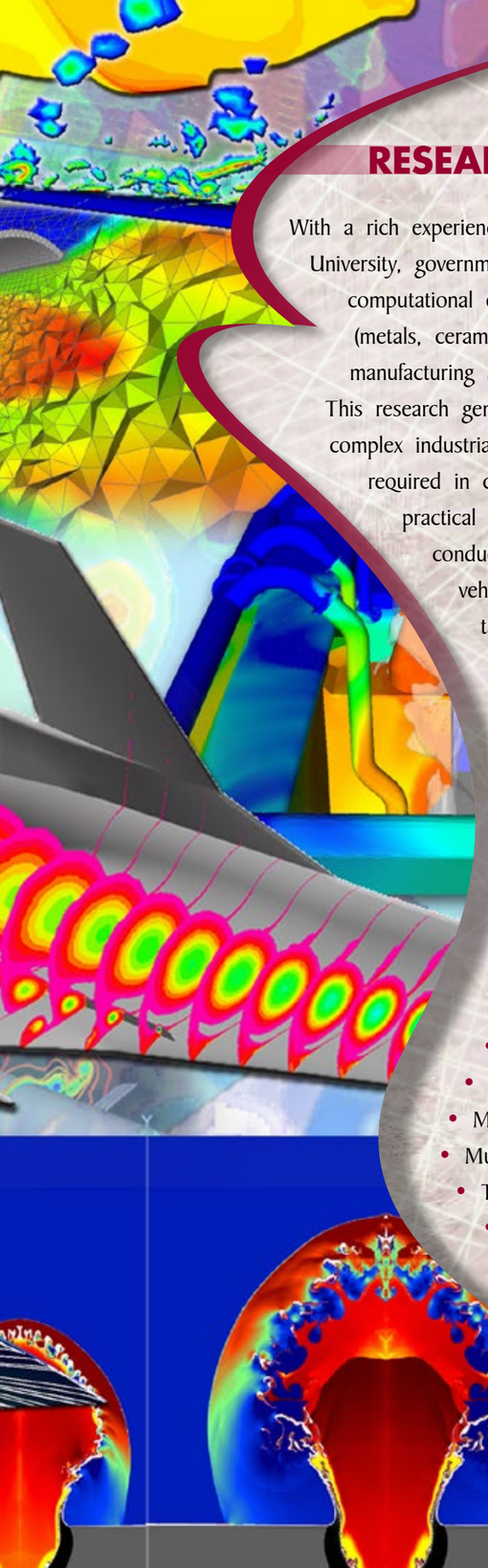
RESEARCH: *Materials and Mechanics*



Materials and Mechanics at CAVS combine research from university, government, and professional agencies to develop cutting-edge technology for the processing of engineering materials. The area's niche is based upon a multi-scale method that combines theory, simulation, and experimentation to provide material life cycle assessments. In accomplishing this multi-scale method CAVS hosts a variety of academic areas including mechanical engineering, aerospace engineering, civil engineering, computational engineering, mathematics, physics, education, and agriculture and biological engineering. Focus areas include:

- Multi-scale Experimentation
- Materials Characterization
- Materials Processing
- Nano-microstructure Analysis
- Lightweight Materials
- Bio-materials
- Particulate Materials
- Verification and Validation
- Engineering Informatics



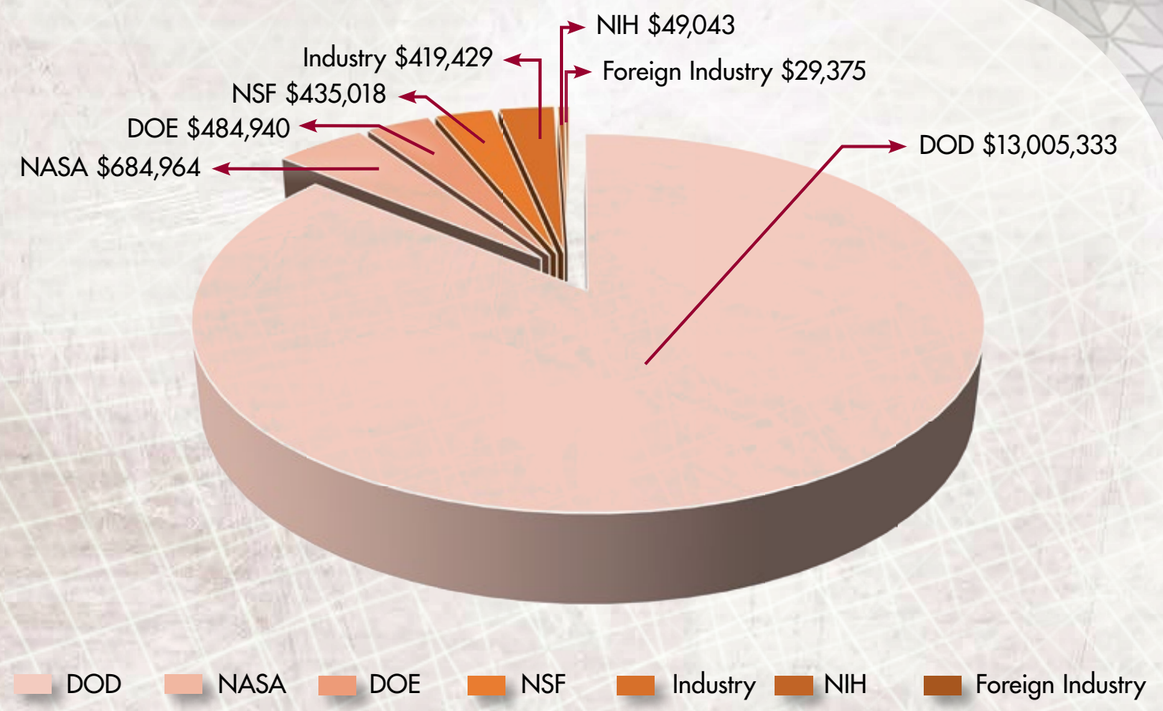


RESEARCH: *Modeling and Simulation*

With a rich experience in solids and fluids mechanics, CAVS serves Mississippi State University, government agencies, and industry through the development of advanced computational engineering tools. Computational engineering accelerates materials (metals, ceramics, polymers, biomaterials, and geomaterials) in design and manufacturing applications by employing multiscale material modeling methods. This research generates critical knowledge on material behavior capabilities and complex industrial performance problems. This reduces the time and cost often required in complex field simulation while increasing fidelity and scope for practical engineering analysis and design problems. Researchers have conducted modeling and simulations for the design and analysis of vehicles, submarines, surface ships, aircraft, military launch vehicles, tactical missiles, turbomachinery, blood pumps, and more. CAVS research in Modeling and Simulation include:

- Integrated Computational Materials Engineering (ICME)
- Aerodynamics
- Atomistic Modeling
- Chemically Reacting Flow
- Crystal Plasticity
- Dislocation Dynamics
- Electronic Structures Simulations
- Energetics
- Fluid-Structure Interaction
- Internal State Variable Theory
- Mesh Generation
- Multi-Objective Design Optimization
- Multiscale Material Modeling
- Thermal Management
- Uncertainty Analysis

AWARDS



2013 PUBLICATIONS:

Book or Book Chapter

1. "A Three-Dimensional Lattice Boltzmann-Cellular Automaton Model for Dendritic Solidification under Convection," Eshraghi, M., Jelinek, B., Felicelli, S. D., TMS2013 Supplemental Proceedings, John Wiley & Sons, Inc, Feb 2013.

2. "A Visual Analytics Approach for Correlation, Classification, and Regression Analysis," Steed, C., Swan II, J. E., Fitzpatrick, P. J., Jankun-Kelly, T. J., Innovative approaches of data visualization and visual analytics, IGI Global, In Mao Lin Huang and Weidong Huang, Dec 2013, 25-45.

3. "Element Exchange Method for Stochastic Topology Optimization," Rouhi, M., Rais-Rohani, M., Metaheuristic Applications in Structures and Infrastructures ISBN: 978-0-12-398364-0, Elsevier, In Gandomi, A., Yang, X-S., Talatahari, S., and Alavi, A., Feb 2013.

4. "Large Scale Parallel Lattice Boltzmann Model of Dendritic Growth," Jelinek, B., Eshraghi, M., Felicelli, S. D., EPD Congress 2013, John Wiley & Sons, Inc, Jan 2013.

5. "Materials of the Future: From Business Suits to Space Suits," Horstemeyer, M., Data-Intensive Science, Chapman and Hall/CRC, In T. Critchlow and K. Kleese van Dam, Jun 2013, 103-120.

6. "Performance Optimization of Scientific Applications Using an Autonomic Computing Approach," Banicescu, I., Ciorba, F. M., Srivastava, S., Scalable Computing and Communications: Theory and Practice, John Wiley and Sons, Feb 2013, 22, 437-466.

7. "Phasor Measurement Unit and Phasor Data Concentrator Cyber Security," Morris, T., Adhikari, U., Pan, S., Younan, N. H., King, R., & Madani, V., Systems and Optimization Aspects of Smart Grid Challenges, Springer Berlin Heidelberg, Nov 2013.

Peer-Reviewed Journals

1. "A Continuum Model for Hydrogen-Assisted Void Nucleation in Ductile Materials," Chandler, M.Q., Bammann, D., Horstemeyer, M., Modelling and Simulation in Materials Science and Engineering, IOP Science, Jun 2013, 21(5), 1-18.

2. "A Control Algorithm for Statistically Stationary Large Eddy Simulations of Thermally Stratified Boundary Layers," Sescu, A., & Meneveau, C., Quarterly Journal of the Royal Meteorological Society, Wiley, Oct 2013.

3. "A Modified K-e Model for Computation of Flows with Large Streamline Curvature," Yin, J.L., Wang, D., Wu, Y., Walters, K., Advances in Mechanical Engineering, May 2013, 2013(592420), 1-10.

4. "A Multiscale Model for Electro-thermo-elasto-plastic Piezoelectric Metal Matrix Multifunctional Composites," Tang, T., Felicelli, S. D., International Journal of Engineering Science, Vol. 73. pp 1-9, Jul 2013.

5. "A Review on Phase Field Modeling of Martensitic Phase Transformation," Mamivand, M., Asle Zaeem, M., El Kadiri, H., Computational Materials Science, Sep 2013, 77, 304–311.

6. "Accurate Battery Pack Modeling for Automotive Applications," Li, J., Mazzola, Michael. Journal of Power Sources, Elsevier, Sep 2013, 237, 215-228.

7. "An Internal State Variable Material Model for Predicting the Time, Thermomechanical, and Stress State Dependence of Amorphous Glassy Polymers Under Large Deformation," Bouvard, J.-L., Francis, D.K., Tschopp, M. A., Marin, E., Bammann, D., Horstemeyer, M., International Journal of Plasticity, Jan 2013, 42, 168-193.

8. "Analysis of Ignition Behavior in a Dual Fuel Turbocharged Direct Injection Engine Using Propane and Methane As Primary Fuels," Polk, A. C., Gibson, C. M., Shoemaker, N., Srinivasan, K. K., Krishnan, S. R., Transactions of the ASME: Journal of Energy Resources Technology, Sep 2013, 135(3), 032202-032202-1.

9. "Anisotropy in Hexagonal Close-packed Structures: Improvements to Crystal Plasticity Approaches Applied to Magnesium Alloy," Oppedal, A. L., El Kadiri, H., Tomé, C.N., Vogel, S.C., Horstemeyer, M., Philosophical Magazine, Taylor & Francis, Jul 2013, 93(35), 4311-4330.

10. "Capturing the Effect of Temperature, Strain Rate, and Stress State on the Plasticity and Fracture of Rolled Homogeneous Armor (RHA) Steel," Whittington, W. R., Oppedal, A. L., Turnage, S., Hammi, Y., Rhee, H., Allison, P., Crane, C.K., Horstemeyer, M., Materials Science and Engineering: A, Elsevier, Nov 2013, 594, 82-88.

11. "Characterization, Prediction, and Optimization of Flexural Properties of Vapor-Grown Carbon Nanofiber/Vinyl Ester Nanocomposites by Response Surface Modeling," Lee, J., Nouranian, S., Torres, G.W., Lacy, T., Toghiani, H., Pittman, C., & DuBien, J.L., Journal of Applied Polymer Science, May 2013, 130(3), 2087-2099.

12. "Characterizing the Local Primary Dendrite Arm Spacing in Directionally Solidified Dendritic Microstructures," Tschopp, M. A., Miller, J.M., Oppedal, A. L., & Solanki, K.N., Metallurgical and Materials Transactions A, Springer US, Sep 2013, 45(I), 426-437.

13. "Combustion Variations in Dual Fuel Partially Premixed Pilot-Ignited Natural Gas Engines," Srinivasan, K. K., Krishnan, S. R., & Qi, Y., J. Energy Resour. Technol., ASME, Sep 2013, 136(I), 012003-012003-1.

14. "Comments on "extended Zonal Dislocations Mediating {11-22} [11-2-3] Itwinning in Titanium"," El Kadiri, H., Barrett, C. D., Philosophical Magazine, Sep 2013, 93(26), 3491-3494.

15. "Computational Prediction of Effective Magnetostriction and Moduli of Multiphase Magnetostrictive Composites," Tang, T., Myers, O., Felicelli, S. D., International Journal of Engineering Science, Vol. 72, pp 1-10, Nov. 2013

16. "Computational Ship Hydrodynamics: Nowadays and Way Forward," Stern, F., Yang, J., Wang, Z., Hosseini, S.H., Mousaviraad, M., Bhushan, S., & Xing, T., International Shipbuilding Progress, Jul 2013, 60(I-4), 3-105.

17. "Corrosion Behaviour of Extruded AM30 Magnesium Alloy Under Salt-Spray and Immersion Environments," Song, W., Martin, H. J., Hicks, A., Seely, D., Walton, C. A., Lawrimore, W. B., Wang, P., Horstemeyer, M., Corrosion Science, El Sevier, Oct 2013, 78(I), 353-368.

18. "Coupled Finite Element Simulation and Optimization of Single- and Multi-Stage Sheet-Forming Processes," Tamasco, C. M., Rais-Rohani, M., & Buijk, A., Engineering Optimization, Taylor and Francis, May 2013, 45(3), 357-373.

19. "Cyclic Breathing Simulations in Large Scale Models of the Lung Airway from the Oronasal Opening to the Terminal Bronchioles," Walters, K., Burgreen, GW, Hester, R., Thompson, D., Lavallee, D., Pruett, W., & Ford-Green, J., ASME 2012 International Mechanical Engineering Congress and Exposition, Jan 2013, 2, 725-733.

20. "Data Mining and Knowledge Discovery in Materials Science and Engineering: A Polymer Nanocomposites Case Study," AbuOmar, O., Nouranian, S., King, R., Bouvard, J.-L., Toghiani, H., Lacy, T., & Pittman, C., Advanced Engineering Informatics, Oct 2013, 27(4), 615–624.

21. "Detailed Characterization of Diesel-ignited Propane and Methane Dual Fuel Combustion in a Turbocharged DI Diesel Engine," Polk, A. C., Gibson, C. M., Shoemaker, N., Srinivasan, K. K., Krishnan, S. R., Proc. IMechE, Part D: J. Automobile Engineering, SAGE Publishers, Jun 2013, 227(9), 1255-1272.

22. "Dynamic Behavior of a Rare-Earth-Containing Mg Alloy, WE43B-T5, Plate with Comparison to Conventional Alloy, AM30-F," Agnew, S.R., Whittington, W. R., Oppedal, A. L., El Kadiri, H., Shaeffer, M., Ramesh, K.T., Bhattacharyya, J., Delorme, R., & Davis, B., JOM, The Minerals, Metals & Materials Society, Nov 2013, 66(2), 277-290.

23. "Dynamic Coefficient Evaluation for an Algebraic Subgrid Stress Model Using a Scale-Variant Approach," Bhushan, S., Walters, K., International Journal of Numerical Methods in Fluids, Dec 2013, 74, 169-188.

24. "Effect of Resistance Spot Welding Parameters on Weld Pool Properties in a DP600 Dual-phase Steel: A Parametric Study Using Thermomechanically-coupled Finite Element Analysis," Eshraghi, M., Tschopp, M. A., Zaeem, M.A., & Felicelli, S.D., Materials and Design, Dec 2013, 56, 387-397.

25. "Effective Property Estimates For Composites Containing Multiple Nanoheterogeneities: Part I Nanospheres, Nanoplatelets, & Voids," Yu, J., Lacy, T., Toghiani, H., Pittman, C., Journal of Composite Materials, Mar 2013, 47(5), 549–558.

26. “Enhancing the Grain Refinement in Polycrystalline Materials Using Surface Mechanical Attrition Treatment at Cryogenic Temperatures,” Darling, K.A., Tschopp, M. A., Roberts, A.J., Ligda, J.P., & Kecskes, L.J., Scripta Materialia, Jun 2013, 69, 461-464.

27. “Evaluation of Hybrid RANS/LES Models for Prediction of Flow Around Surface Combatant and SUBOFF Geometries,” Bhushan, S., Alam, M. F., Walters, K., Computers and Fluids, Nov 2013, 88, 834-849.

28. “Exponential Penalty Function Formulation for Multilevel Optimization Using the Analytical Target Cascading Framework,” DorMohammadi, S., Rais-Rohani, M., Structural and Multidisciplinary Optimization, Mar 2013, 47(4), 599-612.

29. “Failure Analysis and Mechanical Performance Evaluation of a Cast Aluminum Hybrid-iron Golf Club Hosel,” Walton, C. A., Nesbit, B.E., Candia, H.M., Myers, Z.A., Whittington, W. R., Stone, T.W., Journal of Failure Analysis and Prevention, Jul 2013, 13(5), 561-569.

30. “Fast Evaluation of Complex Equations of State,” Collins, E.M., Luke, E., Electronic Journal of Differential Equations, Oct 2013, 20, 27-37.

31. “Finite Element Analysis of Occupant Head Injuries: Parametric Effects of the Side Curtain Airbag Deployment Interaction with a Dummy Head in a Side Impact Crash,” Deng, X., Potula, S., Grewal, H., Solanki, K.N., Tschopp, M. A., Horstemeyer, M., Accident Analysis and Prevention, Jun 2013, 55, 232-241.

32. “Geoscience Data Provenance: An Overview,” Di, L., Yue, P., Ramapriyan, H., King, R., IEEE Transactions on Geoscience and Remote Sensing, Nov 2013, 51(11), 5065-5072.

33. “Global Strain Generated by Shuffling- Dominated,” Li, B., Zhang, Y., Scripta Materialia, Oct 2013, 71, 45-48.

34. “Grain Boundary Segregation of Interstitial and Substitutional Impurity Atoms in Alpha-iron,” Rajagopalan, M., Tschopp, M. A., & Solanki, K.N., JOM (Journal of Materials), Dec 2013, 1, 1-10.

35. “Hybrid 2D-3D Space Vector Modulation Voltage Control Algorithm for Three Phase Inverters,” Albatran, S., Fu, Y., Albanna, A., Schrader, R., Mazzola, Michael. IEEE Transactions on Sustainable Energy, Jul 2013, 4(3), 734-744.

36. “Impact of Relevance and Distraction on Driving Performance and Visual Attention in a Simulated Driving Environment,” Garrison, T. M., Williams, C., Applied Cognitive Psychology, Wiley-Blackwell, Apr 2013, 27(3), 396-405.

37. “Influence of Mn Solute Content on Grain Size Reduction and Improved Strength in Mechanically Alloyed Al-Mn Alloys,” Darling, K.A., Tschopp, M. A., Roberts, A.J., Armstrong, L., Kapoor, D., Mathaudhu, S.N., & Kecskes, L., Materials Science and Engineering A, Oct 2013, 589, 57-65.

38. “Interaction between Prismatic Slip and a Mg17Al12 Precipitate in Magnesium,” Liao, M., Li, B., Horstemeyer, M., Computational Materials Science, El Sevier, Nov 2013, 79, 534-539.

39. “Introduction to the Special Issue on Analysis of Multitemporal Remote Sensing Data,” Bovolo, F., Bruzzone, L., King, R., IEEE Transactions on Geoscience and Remote Sensing, Mar 2013, 51(4), 1867-1869.

40. “Introduction to the Special Issue on Geoscience Data Provenance,” Di, L., Ramapriyan, H., Yue, P., King, R., IEEE Transactions on Geoscience and Remote Sensing, Nov 2013, 51(11), 5062-5064.

41. “Investigation of a Dynamic Hybrid RANS/LES Modelling Methodology for Finite-Volume CFD Simulations,” Walters, K., Bhushan, S., Alam, M. F., Thompson, D., Flow, Turbulence and Combustion, Oct 2013, 91(3), 643-667.

42. “Investigation of Fatigue Anisotropy in an Extruded Magnesium Alloy,” Jordon, J.B., Brown, H., El Kadiri, H., Kistler, M., Lett, R., Baird, J., & Luo, A.A., Internationa Journal of Fatigue, Jan 2013, 51, 8-14.

43. “Laminar, Turbulent, and Transitional Simulations in Benchmark Cases with Cardiovascular Device Features,” Bhushan, S., Walters, K., Burgreen, GW, Cardiovascular Engineering and Technology, Apr 2013, 4(4), 408-426.

44. “Large-scale Parallel Lattice Boltzmann - Cellular Automaton Model of Two-dimensional Dendritic Growth,” Jelinek, B., Eshraghi, M., Felicelli, S. D., & Peters, J.F., Computer Physics Communications, in Press: Elsevier, Sep 2013.

45. “Material Model Uncertainty Quantification Using Evidence Theory,” Salehghaffari, S., Rais-Rohani, M., Proceedings of the Institution of Mechanical Engineers, Part C, Journal of Mechanical Engineering Science, Sage Publishing, Oct 2013, 227(10), 2163-2179.

46. “Mechanical Properties of Amorphous Cellulose Using Molecular Dynamics Simulations with a Reactive Force Field,” Zhang, X., Tschopp, M. A., Horstemeyer, M., Shi, S.Q., & Cao, J., International Journal of Modelling, Identification and Control, Mar 2013, 18, 211-217.

47. “Mitigating Grain Growth in Binary Nanocrystalline Alloys Through Solute Selection Based on Thermodynamic Stability Maps,” Darling, K.A., Tschopp, M. A., Atwater, M.A., VanLeeuwen, B.K., & Liu, Z.K., Computational Materials Science, Nov 2013, 1, 1-10.

48. “Modeling and Probabilistic Design Optimization of a Nanofiber-Enhanced Composite Cylinder for Buckling,” Rouhi, M., Rais-Rohani, M., Composite Structures, Elsevier, Jan 2013, 95, 346-353.

49. “Modeling the Dynamic Failure of Railroad Tank Cars Using a Physically Motivated Internal State Variable Plasticity/Damage Nonlocal Model,” Ahad, F., Enakoutsa, K., Solanki, K.N., Tjiptowidjojo, Y., Bammann, D., Modelling and Simulation in Engineering, Hindawi Publishing Corporation, Mar 2013, 2013, 11 pages.

50. “Modification Design Method for an Enveloping Hourglass Worm Gear with Consideration of Machining and Misalignment Errors,” Horstemeyer, M., Deng, X., & Wang, J., Chinese Journal of Mechanical Engineering, Springer, Sep 2013, 26(5), 948-956.

51. “Nanotwins in Nanocrystalline Mg-Al Alloys: an Insight from High-resolution TEM and Molecular Dynamics Simulation,” Pozuelo, M., Mathaudhu, S.N., Kim, S., Li, B., Kao, W.H., & Yang, J.M., Philosophical Magazine, Taylor & Francis, Sep 2013, 1-8.

52. “Optimization of Structures Under Material Parameter Uncertainty Using Evidence Theory,” Salehghaffari, S., Rais-Rohani, M., Marin, E., Bammann, D., Engineering Optimization, Taylor & Francis, Jun 2013, 45(9), 1027-1041.

53. “Peripheral Stimulation and Its Effect on Perceived Spatial Scale in Virtual Environments,” Jones, J.A., Swan II, J. E., & Bolas, M., IEEE Transactions on Visualization and Computer Graphics, IEEE, Jan 2013, 19(4), 701-710.

54. “Phase Field Modeling of the Tetragonal-to-monoclinic Phase Transformation in Zirconia,” Mamivand, M., Asle Zaeem, M., El Kadiri, H., & Chen, L.Q., Acta Materialia, Aug 2013, 61(14), 5223–5235.

55. “Probabilistic Analysis and Optimization of Energy Absorbing Components Made of Nanofiber Enhanced Composite Materials,” Rouhi, M., Rais-Rohani, M., & Najafi, A., Composite Structures, Elsevier, Feb 2013, 100, 144-153.

56. “Quantifying the Energetics of Carbon Segregation to Fe Symmetric Tilt Grain Boundaries Using Atomistic Simulations,” Rhodes, N., Tschopp, M. A., & Solanki, K.N., Modeling and Simulation in Materials Science and Engineering, Mar 2013, 21(3), 035009.

57. “Repairing Unstructured Triangular Mesh Intersections,” McLaurin, D., Marcum, D., Remotigue, M., & Blades, E. L., International Journal for Numerical Methods in Fluids, Oct 2013, 93(10), 266-275.

58. “Results of FDA’s First Interlaboratory Computational Study in a Nozzle with a Sudden Contraction and Conical Diffuser,” Stewart, S., Hariharan, P., Paterson, E., Burgreen, GW. Cardiovascular Engineering and Technology, Dec 2013, 4(4), 371-394.

59. “Role of Different Material Processing Methods on the Fatigue Behavior of an AZ31 Magnesium Alloy,” Lugo, M., Jordon, J.B., Solanki, K.N., Hector, L.G., Bernard, J.D., Luo, A.A., Horstemeyer, M., International Journal of Fatigue, Jul 2013, 52, 131-143.

60. “Stability Considerations for Silicon Carbide Field Effect Transistors,” Lemmon, A., Mazzola, Michael, Gafford, J., Parker, C., IEEE Transactions on Power Electronics Letters, IEEE, Oct 2013, 28, 4453-4459.

61. “Substructure and Texture Evolution in an Annealed Aluminum Alloy at Medium Strains,” Ma, Q., Mao, W., Li, B., Wang, P., Horstemeyer, M., Metallurgical and Materials Transactions A. Springer, Apr 2013, 44(9), 4404-4415.

62. “Surrogate-based Optimisation of Automotive Structures under Multiple Crash and Vibration Design Criteria,” Kiani M., Gandikota, I., Parrish, A. E., Motoyama, K., Rais-Rohani, M., International Journal of Crashworthiness, Taylor & Francis, Jun 2013, 18(5), 473-482.

63. “Texture Evolution during Dynamic Recrystallization in a Magnesium Alloy at 450 Deg,” Ma, Q., Li, B., Whittington, W. R., Oppedal, A. L., Wang, P., Horstemeyer, M., Acta Materialia, Elsvier, Dec 2013, 67, 102-115.

64. “The Candidacy of Shuffle and Shear During Compound Twinning in Hexagonal Close-packed Structures,” El Kadiri, H., Barrett, C. D., Tschopp, M. A., Acta Materialia, Oct 2013, 61, 7646-7659.

65. “The Effect of Design and Placement of Work Zone Warning Signs on Driver Speed Compliance: A Simulator-based Study,” Strawderman, L., Huang, Y., Garrison, T. M., IIE Transactions on Occupational Ergonomics and Human Factors, Institute of Industrial Engineers, Jan 2013, 1(1), 66-75.

66. “Three Point Bending Behavior of a ZEK100 Mg Alloy at Room Temperature,” Aslam, I., Li, B., McClelland, Z., Horstemeyer, S., Ma, Q., Wang, P., Horstemeyer, M., Mater Sci Eng, Oct 2013, 590, 168-173.

67. “Toward 1DCAE Related Intensive Research Activities with R&D Collaboration; 1DCAE to Estimate Performance Trend,” Motoyama, K., & Malen, D., Journal of The Japan Society for Computational Engineering and Science (JSCES), Sep 2013, 18(3).

68. “Towards Low-Noise Synthetic Turbulent Inflow Conditions for Aeroacoustic Calculations,” Sescu, A., & Hixon, R., International Journal for Numerical Methods in Fluids, In Press, Jul 2013, 73, 1001–1010.

69. “Towards Reaching the Theoretical Limit of Porosity in Conventional Solid State Metal Foams: Intraparticle Expansion As a Primary and Additive Means to Create Porosity,” Atwater, M.A., Darling, K.A., Tschopp, M. A., Advanced Engineering Materials, Dec 2013, 1, 1-10.

70. “Transformations and Cracks in Zirconia Films Leading to Breakaway Oxidation of Zircaloy,” El Kadiri, H., Utegulov, Z.N., Khafizov, M., Asle Zaeem, M., Mamivand, M., Oppedal, A. L., Enakoutsa, K., Cherkaoui, M., Graham, R. H., II, & Arockiasamy, A., Acta Materialia, Elsevier, Jun 2013, 61(11), 3923-3925.

71. “Turn and Zigzag Maneuvers of a Surface Combatant Using a URANS Approach with Dynamic Overset Grids,” Carrica, P., Ismail, F., Hyman, M., Bhushan, S., & Stern, F., Journal of Marine Science and Technology, Feb 2013, 196, 1-16.

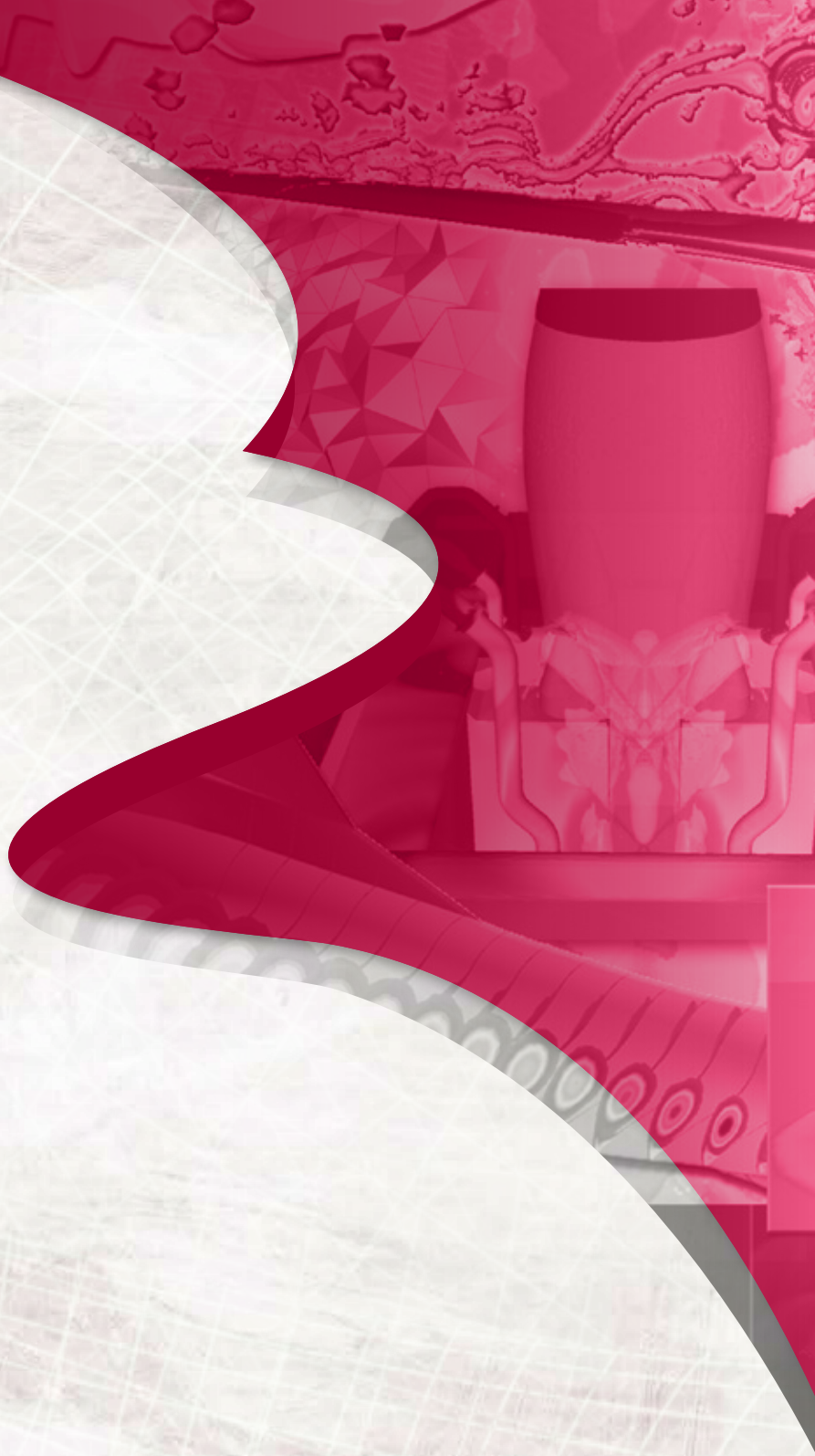
72. “Twin-like Domains and Fracture in Deformed Magnesium,” Li, B., Scripta Materialia, Elsevier, Jun 2013, 69, 493-496.

73. “Ultra-High Thermal Conductivity of Three-Dimensional Flat-Plate Oscillating Heat Pipes for Electromagnetic Launcher Cooling,” Thompson, S.M., Tessler, B.S., Ma, H.B., Smith, D.E., & Sobel, A., IEEE Transactions on Plasma Science: Special Issue on Electromagnetic Launchers, IEEE, Apr 2013, 41(5), 1326-1331.

74. “Unifying Integrated Computational Materials Engineering Research and Education through Cyberinfrastructure,” Sukhija, N., Haupt, T., Horstemeyer, M., Journal of Materials Education (JOM), Denton, TX: The International Council on Materials Education, May 2013, 35(1-2), 21-48.

75. “Unstable Dissociation of a Prismatic Dislocation in Magnesium,” Liao, M., Li, B., Horstemeyer, M., Scripta Materialia, Elsevier, Apr 2013, 69, 246-249.

76. “Welding Parameters Influence on Fatigue Life and Microstructure in Resistance Spot Welding of 6061-T6 Aluminum Alloy,” Florea, R. S., Bammann, D., Yeldell, J., Solanki, K.N., Hammi, Y., Materials & Design, Mar 2013, 45, 456-465.



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