

## Curriculum Vitae

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February 23, 2018

### Education:

- Ph.D. Materials Science, Vanderbilt University, May 1987  
Dissertation: Undercooling of High Melting Temperature Pure Metals in a Containerless, Microgravity Environment, Advisor: R.J. Bayuzick
- M.S. Materials Science, Vanderbilt University, May 1984  
Thesis: Solidification Studies of Nb-Ge Alloys in Drop Tube Experiments  
Advisor: R.J. Bayuzick
- B.A. Chemistry major, Mathematics minor, Vanderbilt University, January 1973

### Employment:

- Present: Founder, Ultra Small Fibers, LLC  
Adjoint Professor of Physics, Department of Physics and Astronomy, Vanderbilt University.
- 2005-present: Adjoint Professor of Electrical Engineering, Department of Electrical Engineering and Computer Science, Vanderbilt University.
- 2005-2016: Research Professor of Materials Science and Engineering, Director of the Center for Laser Applications, University of Tennessee Space Institute.
- 1997-2005: Research Associate Professor of Materials Science and Engineering, Department of Chemical Engineering, Vanderbilt University
- 1991-1997: Research Associate Professor, Department of Materials Science and Engineering, Vanderbilt University
- 1987-1991: Research Assistant Professor, Department of Materials Science and Engineering, Vanderbilt University
- 1982-1987: Graduate Research Assistant, Vanderbilt University
- 1979-1981: Senior Materials Engineer, Pratt-Whitney Aircraft Government Products Division, West Palm Beach, FL
- 1978-1979: Materials Engineer, Pratt-Whitney Aircraft Government Products Division, West Palm Beach, FL
- 1973-1978: Engineer, Magnetic Separation Systems. Nashville, TN

### Honors:

- Presidents Gold Quality Award, Sandia National Laboratory, 1999
- Fellow ASM International, Class of 2007
- University of Canterbury Visiting Erskine Fellowship 2011
- Runner-up NASA 2016 Invention of the Year
- Exceptional Space Act Award (NASA 2016)

## Articles in Refereed Journals:

"Ultrathin Polymer Membranes with Patterned, Micrometric Pores for Organs-on-Chips," Pensabene, V., Costa, L., Terekhov, A. Y., Gnecco, J. S., Wikswo, J. P.; Hofmeister, W. H., *ACS Applied Materials & Interfaces*, volume 8, issue 34, ,2016, pages 2629-22636.

"Patterned polymer matrix promotes stemness and cell-cell interaction of adult stem cells," Hofmeister, L. H., Costa, L., Balikov, D. A., Crowder, S. W., Terekhov, A., Sung, H.-J., and Hofmeister, W. H., *Journal of Biological Engineering*, 2015, volume 9, issue 1, pages 1-9.

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"A microfluidic-enabled mechanical microcompressor for the immobilization of live single- and multi-cellular specimens," Yan, Y., Jiang, L., Aufderheide, K. J., Wright, G. A., Terekhov, A., Costa, L., Qin, K., McCleery, W. T., Fellenstein, J. J., Ustione, A., Robertson, J. B., Johnson, C. H., Piston, D. W., Hutson, M. S., Wikswo, J. P., Hofmeister, W., and Janetopoulos, C., *Microsc Microanal*, 2014, volume 20, issue 1, pages 141-51.

"Rapid, Single-Molecule Assays in Nano/Micro-Fluidic Chips with Arrays of Closely Spaced Parallel Channels Fabricated by Femtosecond Laser Machining," Canfield, B. K., King, J. K., Robinson, W. N., Hofmeister, W. H., and Davis, L. M., *Sensors*, 2014, volume 14, issue 8, pages 15400-15414.

"Engineered three-dimensional microfluidic device for interrogating cell-cell interactions in the tumor microenvironment," Hockemeyer, K., Janetopoulos, C., Terekhov, A., Hofmeister, W., Vilgelm, A., Costa, L., Wikswo, J., and Richmond, A., *Biomicrofluidics*, (2014) volume 8(4), page 044105.

"Intravital Microfluidic Windows for Delivery of Chemicals, Drugs and Probes," Myneni, P., Terekhov, A., Wright, G., Hofmeister, W., and Janetopoulos, C., *Microscopy and Microanalysis*, 2014, 20(S3), 1352-1353.

"Femtosecond laser-patterned nanopore arrays for surface-mediated peptide treatment," Angela L. Zachman, Lucas H. Hofmeister, Lino Costa, Timothy C. Boire, Yu-Shik Hwang, William H. Hofmeister, Hak-Joon Sung; *Nanomedicine: Nanotechnology, Biology and Medicine*, January 2014, vol 10, issue 1, pp.11-14.

"Determination of Bulk Residual Stresses in Electron Beam Additive-Manufactured Aluminum," Craig A. Brice and William H. Hofmeister; *Metallurgical and Materials Transactions A*, Pages 1-7, posted online June 28, 2013. DOI: 10.1007/s11661-013-1847-z

"Poly( $\epsilon$ -caprolactone)-carbon nanotube composite scaffolds for enhanced cardiac differentiation of human mesenchymal stem cells," Spencer W. Crowder, Yi Liang, Rutwik Rath, Andrew M. Park, Simon Maltais, Peter N. Pintauro, William Hofmeister, Chee C. Lim, Xintong Wang, Hak-Joon Sung; *Nanomedicine*, 2013, volume 8, issue 11, pages 1763-1776.

"Cell interaction study method using novel 3D silica nanoneedle gradient arrays," Deepak Rajput, Spencer W. Crowder, Lucas Hofmeister, Lino Costa, Hak-Joon Sung, William Hofmeister, *Colloids and Interfaces B: Biointerfaces*, February, 2013, vol. 102, pp. 111-116.

"Solution-Cast High-Aspect-Ratio Polymer Structures from Direct-Write Templates," Deepak Rajput, Lino Costa, Kathleen Lansford, Alexander Terekhov and William Hofmeister, *ACS Appl. Mater. Interfaces*, 2013, 5 (1), pp 1–5.

“On-Chip Open Microfluidic Devices for Chemotaxis Studies,” G. Wright, L. Costa, A.D. Terekhov, W. Hofmeister, D. Jowhar, C. Janetopoulos, *Microscopy and Microanalysis*, August, 2012, vol. 18, issue 4, pp. 816-828.

“Silica coating of nanowires produced via nanoimprint lithography from femtosecond laser machined templates,” Deepak Rajput, Lino Costa, Alexander Terekhov, Kathleen Lansford and William Hofmeister, *Nanotechnology*, February, 2012, vol. 23, 105304.

“Investigation of Atypical Molten Pool Dynamics in Tungsten Carbide-Cobalt During Laser Deposition using In-Situ Thermal Imaging,” Yuhong Xiong, William H. Hofmeister, John E. Smugeresky, Jean-Pierre Delplanque, Julie M. Schoenung, *Appl. Phys. Lett.*, Jan. 2012, vol. 100, issue 3, 034101.

“Femtosecond laser machined microfluidic devices for imaging of cells during chemotaxis,” L. Costa, A. Terekhov, D. Rajput, W. Hofmeister, D. Jowhar, G. Wright, and C. Janetopoulos, *Journal of Laser Applications*, November 2011, vol. 23, issue 4, p.042001.

“On femtosecond micromachining of HPHT single-crystal diamond with direct laser writing using tight focusing,” O. H. Y. Zalloum, M. Parrish, A. Terekhov, and W. Hofmeister, *Optics Express*, June 2010, vol. 18, number 12, pp. 13122-13135.

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“The tower nozzle solid freeform fabrication technique,” Lino Costa, Deepak Rajput, Kathleen Lansford, Wenqiang Yue, Alexander Y Terekhov, William Hofmeister, *Rapid Prototyping Journal*, 2010, vol.16, issue 4.

“Field Effect Control of Electroosmotic Pumping using Porous Silicon-Silicon Nitride Membranes,” Saumitra K. Vajandar, Dongyan Xu, Jiashu Sun, Dmitry Markov, William Hofmeister, Deyu Li, *IEEE/ASME Journal of Microelectromechanical Systems*, December 2009, vol. 18, issue 6, pp. 1173-1183.

“In-situ Thermal Imaging and Three-dimensional Finite Element Modeling of Tungsten Carbide-Cobalt During Laser Deposition,” Yuhong Xiong, William H Hofmeister, Zhao Cheng, John E Smugeresky, Enrique J Lavernia, and Julie M Schoenung, *ACTA Materialia*, 2009, vol. 57, issue 18, pp. 5419-5429.

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“Molybdenum-on-Chromium Dual Coating on Steel,” D. Rajput, K. Lansford, L. Costa, W. Hofmeister, *Surface & Coatings Technology*, Jan 2009, vol. 203, issue 9, pp.1281-1287.

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“The effects of deposition and synthesis parameters on size, density, structure, and field emission properties of Pd-catalyzed carbon nanotubes synthesized by thermal chemical vapor deposition (CVD),” S. Wei, J.L. Davidson, J.H. Huang, W.P. Kang, Y.M. Wong, and W.H. Hofmeister; *J. Vac. Sci. Tech. B.*, March 2005, vol. 23, no. 2, pp. 793-799.

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“Experimental Characterization of Anode Heating due to Electron Field Emission,” C.T. Harris, D.G. Walker, T.S. Fisher, W.H. Hofmeister; *Microscale Thermophysical Engineering*, April/June 2004, vol. 8, no. 2, pp. 101-109.

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“Effect of Dilute Amounts of Oxygen Solute on Nucleation of Zirconium,” M. J. Wert, W. H. Hofmeister, and R. J. Bayuzick, *Journal of Applied Physics*, March 15, 2003, vol. 93, issue 6, pp. 3643-3651.

“The Solidification Velocity of Pure Nickel,” B.T. Bassler, W.H. Hofmeister, R.J. Bayuzick, *Materials Science and Engineering A*, February 2003, vol. 342, issues 1-2, pp. 80-92.

“Formation of  $Y_xNd_{1-x}Ba_2Cu_3O_{7-\delta}$  ( $0 < x < 0.9$ ) superconductors from an undercooled melt via aero-acoustic levitation,” D.E. Gustafson, W.H. Hofmeister, R.J. Bayuzick, K. Nagashio, and K. Kuribayashi, *Materials Science and Engineering A*, January 2003, vol. 341, issues 1-2, pp. 1-8.

“Solidification in Direct Metal Deposition by LENS Processing,” W. Hofmeister, M. Griffith, M. Ensz, and J. Smugeresky, *Journal of Metals*, September, 2001, vol. 53, no. 9, pp. 30-34.

“Formation of  $NdBa_2Cu_3O_{7-\delta}$  amorphous phase by combining aero-acoustic levitation and splat quenching,” K. Nagashio, W. H. Hofmeister, D. E. Gustafson, A. Altgilbers, R. J. Bayuzick and K. Kuribayashi, *J. Mater. Res.*, January 2001, vol. 16, no. 1, pp. 138-145.

“Investigations to the Influence of Oxygen on the Surface Tension of Zirconium by Oscillating Drop Technique,” M. Rösner-Kuhn, W. H. Hofmeister, G. Kuppermann, R. J. Bayuzick, and M. G. Froberg, *Surface Science*, December 1999, vol. 443, no. 3, pp. 159-164.

“High-temperature phase relationships for  $Y_xNd_{1-x}Ba_2Cu_3O_y$  ( $0.7 < x < 1.0$ ) superconductors via containerless processing,” J.R. Olive, W.H. Hofmeister, R.J. Bayuzick, and M. Vlasse, *J. Mater. Res.*, October 1999, vol. 14, no. 10, pp. 3843-3850.

“High-temperature phase relationships for  $Y_xNd_{1-x}Ba_2Cu_3O_y$  ( $0 < x < 0.5$ ) superconductors via containerless processing,” J.R. Olive, W.H. Hofmeister, R.J. Bayuzick, and M. Vlasse, *J. Mater. Res.*, October 1999, vol. 14, no. 10, pp. 3851-3858.

“Discussion of Superheating Behavior of NiAl,” W.H. Hofmeister, *Metall. Trans. A*, 1999, vol. 30A, p. 1675.

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“Understanding thermal behavior in the LENS process,” M.L. Griffith, M.E. Schlienger, L.D. Harwell, M.S. Oliver, M.D. Baldwin, M.T. Ensz, M. Essien, J. Brooks, C.V. Robino, J.E. Smugeresky, W.H. Hofmeister, M.J. Wert, D.V. Nelson; *Materials and Design*, 1999, vol. 20, pp. 107-113.

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"Formation of Tetragonal  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$  from an Undercooled Melt," J.R. Olive, W.H. Hofmeister, R.J. Bayuzick, G. Carro, J.P. McHugh, R.H. Hopkins, M. Vlasse, R. Weber, P. Nordine, M. McElfresh; *J. Mater. Res.*, 1994, vol. 9, no. 1, pp. 1-3.

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### **Other Publications:**

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### **Invited Presentations:**

“Reflections on Research, Education and Learning,” W. Hofmeister, Vanderbilt Chapter Sigma Xi Annual Banquet, University Club Nashville, April27, 2013.

“The Physics of Direct Metal Deposition Processes,” W. Hofmeister; Advanced Manufacturing and Automated Fastening Conference, September 20-23, 2004, St. Louis, MO.

“Issues in the Commercialization of the Laser Engineered Net Shaping (LENS®) Process,” William Hofmeister and Michelle Griffith; Symposium on High Risk Technologies in Metallurgy with Commercial Potential, TMS Annual Meeting, Charlotte, NC, March 14-18, 2004.

“Thermal Imaging of Solidification and Strip Casting,” William Hofmeister, Seminar to the Materials Preparation Center, Ames Laboratory, Ames Iowa, August 22, 2002.

“Melt Pool Imaging For Control Of LENS™ Processing,” William Hofmeister, Michelle Griffith, Mark Ensz, and John Smugeresky, 2002 International Conference on Metal Powder Deposition for Rapid Manufacturing, San Antonio, TX, April 8-10, 2002.

“Thermal Imaging of Solidification,” William Hofmeister, in Symposium on Imaging of Dynamic Processes, TMS Annual Meeting, Seattle, WA, February 19-20, 2002.

“Rapid Prototyping by Direct Metal Deposition,” William Hofmeister, lecture to the Department of Mechanical Engineering at University of Canterbury, Christchurch, NZ, July 5, 2001.

“Thermal Imaging and Control of Laser Powder Deposition Processing,” W.H. Hofmeister, Rapid Manufacturing Seminar on Laser and Powder Based Technologies. Metal Powder Industries Federation, Providence, RI, October 23-24, 2000.

“Thermal Imaging of LENS Processing” W. Hofmeister, Thermal Spray Workshop, NIST, Gaithersburg, MD. November, 1998.

"Ultra High Speed Thermal Imaging for Solidification Kinetics, Droplet Impacts and Rapid Manufacturing," W. Hofmeister, Naval Research Laboratory, October, 1998.

"State of the Art Materials Research using TEMPUS and Its Prospective Contributions to Industrial Applications," W. Hofmeister and R.J. Bayuzick, IN SPACE '98, Tokyo, Japan, September, 1998.

"Containerless Processing of Metallic Melts in Space," W. Hofmeister, R.J. Bayuzick, in session on "Advancing Technology Through Space Experiments," International Conference on Powder Metallurgy and Particulate Materials, Las Vegas, NV, June 1998.

“Ultra High Speed Thermal Imaging for Solidification Kinetics,” W. Hofmeister, B.T. Bassler, and R.J. Bayuzick, Seminar for Sandia National Laboratory Advanced Materials Processing Laboratory, Albuquerque, NM, May, 1998.

“Solidification Kinetics,” W. Hofmeister, Seminar to Physics Department, Washington University at St. Louis, May, 1997.

“Measurement of High Speed Solidification Velocity in Metallic Melts,” W.H. Hofmeister, B.T. Bassler, and R. J. Bayuzick; Joint TMS-JIM Conference, Honolulu, Hawaii, December 1995.

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## **Presentations:**

"Machining High Aspect Ratio Features with Single Femtosecond Laser Pulses." Canfield, B. K., Bowman, T., Costa, L., Rajput, D., Terekhov, A., Hofmeister, W. H., and Davis, L. M., *Presented at Frontiers in Optics*.

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"Glass microfluidics for cell migration studies," G. Wright, L. Costa, A. Terekhov, W. Hofmeister, D. Jowhar, C. Janetopoulos; Frontiers in Cell Migration & Mechanotransduction - NIH Natcher Conference Center, Main Auditorium, Building 45, Bethesda MD, May 24 - 26, 2011.

"Glass microfluidics for passive chemoattractant gradient generation," G. Wright, L. Costa, A. Terekhov, W. Hofmeister, D. Jowhar, C. Janetopoulos; Microscopy & Microanalysis 2011 Meeting - Nashville, TN, August 7-11 2011.

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"Characterization of electron beam deposited aluminum alloy 2139," Milo Kral, Karl Buchanan, Craig Brice, Marcia Domack, Ravi Shenoy, William Hofmeister, TMS Annual Meeting, Orlando, FL, March 11-15, 2012.

"Silica Nanoneedles as a Tool for Cell Behavioral Studies," D. Rajput, S. Crowder, L. Hofmeister, L. Costa, H-J Sung, and W. Hofmeister, (November 28 - December 2, 2011) MRS Fall Meeting & Exhibit, Boston, Massachusetts.

"Fabrication of Addressable Biological Devices using Femtosecond Laser Machining," D. Rajput, L. Costa, K. Lansford, A. Terekhov, and W. Hofmeister, 30<sup>th</sup> International Congress on Applications of Lasers and Electro-Optics, Orlando, Florida, USA, 2011.

"Nanostructured Silica Functionalized Cell Culture Substrates," Rajput D., S. Crowder, L. Hofmeister, L. Costa, H-J Sung, and W. Hofmeister, Sigma Xi Annual Meeting & International Research Conference, Raleigh, North Carolina, November 10-13, 2011.

"Nanochannels, Nanoholes and Nanowires," L.M. Davis, W. Hofmeister, L. Costa, A. Terekhov, B. Canfield, J. King, and D. Rajput, 2011 CNMS User Meeting, Oak Ridge, Tennessee, September 19-20, 2011. <http://cnms.ornl.gov/workshops/2011/usermtg2011.shtm>

"Nanoneedle Fabrication Using Femtosecond Laser Machined Templates," D. Rajput, L. Costa, K. Lansford, A. Terekhov, and W. Hofmeister, 14<sup>th</sup> Annual Southeast Ultrafast Conference (SEUFC), Oak Ridge, Tennessee, 2011.

"Single-pulse Ultrafast-laser Machining of SiO<sub>2</sub> Templates for Nano-needle Fabrication," D. Rajput, L. Costa, K. Lansford, A. Terekhov, O. Zalloum and W. Hofmeister, 29<sup>th</sup> International Congress on Applications of Lasers and Electro-Optics, Anaheim, California, USA, 2011.

"Laser Deposition Processing for Engineering and Custom Alloy Applications: Metals to Cermets," John Smugeresky, Jonathan Nguyen, Baolong Zheng, Yuhong Xiong, William

Hofmeister, Julie Schoenung, Enrique Lavernia, Materials Science & Technology 2010, Houston, TX, October 17-21, 2010.

“Investigation of a ‘Swirling’ Phenomenon in Tungsten Carbide-Cobalt during Laser Deposition Using *In-Situ* Thermal Imaging,” Yuhong Xiong, William Hofmeister, John Smugeresky, Jonathan Nguyen, Jean-Pierre Delplanque, and Julie Schoenung, TMS Annual Meeting, Seattle, WA, February 14-18, 2010.

“Thermal History and Mechanical Behavior of PH13-8Mo Fabricated via LENS®,” Jonathan Nguyen, Baolong Zheng, Yuhong Xiong, William Hofmeister, John Smugeresky, Yizhang Zhou, Enrique Lavernia, TMS Annual Meeting, Seattle, WA, February 14-18, 2010.

“Microfluidic device for the 3-D electrokinetic manipulation of single molecules,” J.K. King, L.M. Davis, B.K. Canfield, P.C. Samson, and W.H. Hofmeister, Frontiers in Optics, Optical Society of America Annual Meeting, San Jose, CA, October 11-15, 2009.

“Microfluidic device for the electrokinetic manipulation of single molecules,” J.K. King, L.M. Davis, B.K. Canfield, P.C. Sampson, W.H. Hofmeister, American Physical Society March meeting, Pittsburgh, PA, March 16-20, 2009.

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“Single-pulse fabrication of deep vertical nano-holes with a microjoule femtosecond laser,” L.M. Davis, Y.V. White, X. Li, Z. Sikorski, W. Hofmeister, American Physical Society March meeting, Pittsburgh, PA, March 16-20, 2009.

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“Femtosecond laser micro-patterning of diamond films for device fabrication,” M. Parrish, Y. White, L.M. Davis, Z. Sikorski, R. Thompson, W. Hofmeister, International Congress on Applications of Lasers and Electro Optics (ICALEO) 2008, Temecula, CA., October 20–23, 2008.

“Actively-controlled electrokinetic delivery of single fluorescent biomolecules in fluidic nanochannels,” B. Canfield, L.M. Davis, X. Li, W. Hofmeister, I.P. Lescano-Mendoza, B. Bomar, Z. Sikorski, W. Robinson, J. King, J. Germann, G. Shen, J. Wikswo, D. Markov, P. Samson, and C. Daniel, Center for Nanoscale Materials Sciences User Meeting, Oak Ridge, TN, September 24–26, 2008.

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“Microfluidic device for 3-D electrophoretic trap,” J.K. King, B.K. Canfield, L.M. Davis, W. Hofmeister, Z. Sikorski, D.A. Markov, and P. Samson, 8<sup>th</sup> Annual Southeast Multiphoton Confocal User Group Meeting & Workshop, Sponsored by Zeiss, Coherent and Emory University, Atlanta, GA, August 21–22, 2008.

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“Cast carbide-metal composite components via laser based solid freeform fabrication,” W. Hofmeister, L. Costa, D. Rajput, K. Lansford, 26<sup>th</sup> ICALEO, Orlando, FL USA, October 29-November 1, 2007, LIA.

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“Axis-symmetric solid freeform fabrication of W-TiC cermelt rocket nozzles,” L. Costa, W. Hofmeister, D. Rajput, K. Lansford, 2008 World Congress on Powder Metallurgy & Particulate Materials, Washington, DC, June 8-12, 2008, MPIF/APMI.

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“Electrokinetic Control of Single Molecules in Fused Silica Fluidic Nanochannels,” B. K. Canfield, X. Li, W. Hofmeister, and L. M. Davis, in Conference on Lasers and Electro-Optics/Quantum Electronics and Laser Science Conference and Photonic Applications Systems Technologies 2008 Technical Digest (Optical Society of America, Washington, DC, 2008), CThZ7.

“Consolidation of nanoencapsulated powder sheets with photons,” William Hofmeister, Lino Costa, Zbigniew Sikorski, Adrian Sabau, Dean Baker, PowderMet 2007, May 14-16, 2007, Denver, Colorado.

“*SPARTAN: Single Protein Actuation by Real-Time Transduction of Affinity in Nanospace*,” J. Wikswo, R. Mernaugh, D. Markov, P. Samson, D. Li, L. Davis, W. Hofmeister, Z. Sikorski, X. Li, Y. White, G. Shen, W. Robinson, A. Ellington, G. Georgiou, B. Iverson, D. Makarov, G. Marriott, C. Petchprayoon, R. Perrins, C. Daniel, V. Chellaboina and Bill Hamel, Defense Nanomaterials Conference 2007, San Diego, CA April 23-26, 2007

“Modeling of Electron Beam Freeform Fabrication (ebf3) for Zero Gravity,” W.



Hofmeister, L. Costa, Z. Sikorski, J. Steinhoff, K. Taminger, R. Hafley, 18<sup>th</sup> Advanced Materials and Processes Conference, AeroMat 2007, June 25-28, 2007 Baltimore, MD.

“Thermal Imaging of Electron Beam Freeform Fabrication,” W.H. Hofmeister, R.A. Hafley, and K. M. Taminger; AeroMat 2004, June 7-10, 2004, Seattle, WA.

“Transistor Characteristics of Thermal CVD Carbon Nanotubes Field Emission Triode”, Y. M. Wong, W. P. Kang J. L. Davidson, W. Hofmeister, S. Wei, and J. H. Huang, presented at 17<sup>th</sup> International Vacuum Nanoelectronics Conference, Cambridge, MA, USA, 11-16 July, 2004.

“High flow rate electro-osmotic pumps”, S. K. Vajandar, D. Xu, D. Markov, J. P. Wikswo, W. Hofmeister and D. Li, ASME IMECE, Chicago, IL, 2006.

“The growth aspects of nanocrystalline diamond films and their effects on electron emissions”, K. Subramanian, W. P. Kang, J. L. Davidson, and W. H. Hofmeister, presented at 17<sup>th</sup> International Vacuum Nanoelectronics Conference, Cambridge, MA, USA, 11-16 July, 2004.

“The effects of process parameters on size, density, structure, and field emission properties of Pd-catalyzed carbon nanotubes synthesized by thermal chemical vapor deposition,” S. Wei, W. P. Kang, W. H. Hofmeister, J.L. Davidson, Y. M. Wong, and J. H. Huang”, presented at 17<sup>th</sup> International Vacuum Nanoelectronics Conference, Cambridge, MA, USA, 11-16 July, 2004.

“Diamond Vacuum Field Emission Devices”, W. P. Kang, J. L. Davidson, Y. M. Wong, R. Takalkar , K. Holmes, W. Hofmeister, presented at the 9<sup>th</sup> International Conference on Diamond Science and Technology, Tokyo, Japan, March 26-29, 2004

“Carbon Nanotubes Field Emission Devices Grown by Thermal CVD with Palladium as Catalysts”, Y.M. Wong, S. Wei, W.P. Kang, J.L. Davidson, W. Hofmeister, J.H. Huang, Y. Cui, presented at the 9<sup>th</sup> International Conference on Diamond Science and Technology, Tokyo, Japan, March 26-29, 2004

“Thermal CVD grown carbon nanotubes field emission triode”, Y. M. Wong, W. P. Kang, J. L. Davidson, W. Hofmeister, S. Wei, and J. H. Huang, presented at Diamond 2004, Riva Del Garda, Trentino, Italy, 12-17 September, 2004.

“The effect of growth rate control on the morphology of nanocrystalline diamond”, K. Subramanian, W.P. Kang, J.L. Davidson, and W.H. Hofmeister, presented at Diamond 2004, Riva Del Garda, Trentino, Italy, 12-17 September, 2004.

“Micropatterned Diamond/Carbon Field Emission Diode and Triode”,J. L. Davidson, W. P. Kang, Y. M. Wong, R. Takalkar, and W. Hofmeister, presented at ECS 2004 Joint International Meeting, Hawaii, USA, 3-8 October, 2004.

“Optimum Stability in Rapidly Solidified Nickel-Based Alloys,” Paul R. Algosio, William H. Hofmeister, Robert J. Bayuzick, Solidification Processes and Microstructures: A Symposium in Honor of Prof. W. Kurz, TMS Annual Meeting, Charlotte, NC, March 14-18, 2004.

“Determination of nucleation kinetic parameters of metallic melts using electrostatic levitation techniques,” M. J. Wert, W. H. Hofmeister, R. J. Bayuzick, J. Rogers, T. Rathz, G. Fountain, R. Hyers, TMS Annual Meeting, San Diego, CA, March 2003.

“Solidification Velocity of Undercooled Nickel-based Alloys,” P.R. Algos, W.H. Hofmeister, R.J. Bayuzick, TMS Annual Meeting, San Diego, CA, March 2003.

"Residual Gas Effects on Solidification Velocity in Electromagnetic Levitation," P.R. Algos, W.H. Hofmeister and R.J. Bayuzick, Poster presentation at Gordon Research Conferences: Gravitational Effects in Physico-Chemical Systems, New London, CT, July 27 - August 1, 2003.

"Residual Gas Effects on Solidification Velocity in Electromagnetic Levitation," P.R. Algos, W.H. Hofmeister and R.J. Bayuzick, Presentation at ASM Materials Solutions 2003: Progress in Solidification and Crystal Growth Technology in the Last Century, Pittsburgh, PA, Oct 13 - 15, 2003.

“Statistical modeling of nucleation kinetics,” W. Hofmeister, Workshop on aging and long-term reliability of microelectronics materials and devices, October 9-10, 2003, Vanderbilt University, Nashville, TN.

“Using Thermal Imaging to Model LENS Powder Deposition,” William Hofmeister and John Smugeresky, 2002 International Conference on Process Modeling in Powder Metallurgy and Particulate Materials, Metal Powder Industries Federation, Newport Beach, CA, October 28-29, 2002.

“Nucleation and solidification kinetics in low earth orbit,” W. Hofmeister, M. Wert, A. Altgilbers, R. Bayuzick, Paper number 2001-5048, AIAA conference proceedings, ISS Utilization Conference, Cocoa Beach, FL, October 14-18, 2001.

“Site Occupancy Determination by ALCHEMI of Nb and Cr in gamma-TiAl and their Effects on the Alpha to Gamma Massive Phase Transformation,” T.M. Miller, L. Wang, W.H. Hofmeister, J.E. Wittig, I.M. Anderson, MRS Symposium, Boston, MA, November, 1999.

“Understanding Thermal Behavior in LENS Processing of Structural Materials,” Michelle Griffith, Lane Harwell, M. Eric Schlienger, John Smugeresky, William Hofmeister; Solid Freeform Fabrication Symposium, TMS Annual Meeting, San Diego, CA, March, 1999.

“High-Speed Thermal Imaging for LENS Process Development and Control,” W.H. Hofmeister, Melissa J. Wert, John E. Smugeresky, M.L. Griffith, Mark Ensz, Lane Harwell, Don Greene, Dan MacCallum, Gerry Knorovsky, LENS CRADA meeting, Ft. Worth, TX February, 1999.

“Laser near-net shaping for rapid manufacturing - potential for mesoscale structures,” W. Hofmeister, U.S. Army Research Office Workshop on Rapid Manufacturing, Nashville, TN, December, 1998.

“Ultra High Speed Imaging of Thermal Gradients during LENS Processing,” Melissa J. Wert, W.H. Hofmeister, R.J. Bayuzick, M.L. Griffith, John E. Smugeresky, Solid Freeform and Additive Fabrication Symposium, MRS, Boston, MA, December, 1998.

“Nucleation Experiments on TEMPUS in Low Earth Orbit,” W. Hofmeister, C.W. Morton, M.B. Robinson, R.J. Bayuzick, TEMPUS symposium, TMS, Rosemont, IL, October, 1998.

“Effects of Fluid Flow on Nucleation,” W. Hofmeister, R.J. Bayuzick, M.B. Robinson, MSL-1R L+1 Science Review, Huntsville, AL, August, 1998.

“Containerless Processing of Oxide Superconductors,” W. Hofmeister, J. Olive, R. J. Bayuzick, M. Vlasse, Microgravity Materials Science Conference, Huntsville, AL, July, 1998.

“Effects of Fluid Flow on Nucleation,” W. Hofmeister, C. M. Morton, R.J. Bayuzick, M.B. Robinson, Microgravity Materials Science Conference, Huntsville, AL, July, 1998.

"An Investigation into the local Solidification Rate of the GTA Weld Pool," David R. DeLapp, Daniel A. Hartman, William H. Hofmeister, George E. Cook, Alvin M. Strauss, Fifth International Conference on Trends in Welding Research, Calloway Gardens GA, June 1998.

"Effects of Fluid Flow on Nucleation," W. Hofmeister, R.J. Bayuzick, M.B. Robinson, International Workshop on Nucleation and Thermophysical Properties of Undercooled Melts, Bad Honnef, Germany, March, 1998.

"Observation of Thermal Profiles during Impact and Solidification of Nickel Drops," W.H. Hofmeister, R.J. Bayuzick, G. Trapaga, D.M. Matson, and M.C. Flemings; TMS Annual Meeting, San Antonio, TX, February, 1998.

"Nucleation in Metallic Melts," W. Hofmeister, Chemical Engineering Department Seminar, Vanderbilt University, January, 1998.

"Space Flight Experiments on TEMPUS," W. Hofmeister, Materials Science Seminar, Vanderbilt University, January, 1997.

"Spacelab Experiments on TEMPUS; Trick or Treat ?" W. Hofmeister, Mechanical Engineering Department Seminar, October 31, 1996.

"Optical Pyrometry on TEMPUS: A Critical Assessment of Noncontact Temperature Measurement in Low Earth Orbit," W. Hofmeister, R.J. Bayuzick and S. Krishnan, SPIE Conference, Denver, CO, July, 1996.

"Nucleation Kinetic Experiments on TEMPUS," W. Hofmeister, M.B. Robinson, R.J. Bayuzick, Berlin Physical Society Meeting, Regensburg, Germany, March, 1996.

"TEMPUS Scientific Objectives," W. Hofmeister, MSL-1 International Working Group meeting, Huntsville, AL, March, 1996.

"A Statistical Approach to Understanding Nucleation Phenomena," C.W. Morton, W.H. Hofmeister, R.J. Bayuzick, and M.B. Robinson; NATO Advanced Workshop on Undercooling, Il'Ciocco, Italy, June, 1993.

"Bulk Undercooling and Rapid Quench Processing of Refractory Alloys," W.H. Hofmeister and R.J. Bayuzick, MRS Annual Meeting, Boston, MA, December 3, 1993.

"Formation of Tetragonal  $YBa_2Cu_3O_{7-\delta}$  from an Undercooled Melt," J.R. Olive, W.H. Hofmeister, R.J. Bayuzick, G. Carro, J.P. McHugh, R.H. Hopkins, M. Vlasse, R. Weber, P. Nordine, M. McElfresh; Poster presentation at Gordon Conference on Gravitational Effects in Materials and Processes, July, 1993.

"A Statistical Approach to Understanding Nucleation Phenomena," C.W. Morton, W.H. Hofmeister, R.J. Bayuzick, and M.B. Robinson; Poster presentation at Gordon Conference on Gravitational Effects in Materials and Processes, July, 1993.

"Formation of Tetragonal  $YBa_2Cu_3O_{7-\delta}$  from an Undercooled Melt," J.R. Olive, W.H. Hofmeister, R.J. Bayuzick, G. Carro, J.P. McHugh, R.H. Hopkins, M. Vlasse, R. Weber, P. Nordine, M. McElfresh; Poster presentation at Materials Research Society, Boston, MA, December 1, 1993.

"Analysis of the Constraints in Statistical Analysis of Nucleation Data in Ground Based Experiments," W.H. Hofmeister, C.W. Morton, R.J. Bayuzick, M.B. Robinson, T.J. Rathz; World Space Congress, Washington, D.C., September, 1992.

"Comparison of Undercooling of Niobium in Drop Tube Experiments," W.H. Hofmeister, R.J. Bayuzick, M.B. Robinson, B. Vinet, L. Cortella, J. Comera, and J.J. Favier; VIIIth European Symposium on Materials and Fluid Sciences in Microgravity, Brussels, April, 1992. Poster presentation.

"Containerless Processing of Oxide Superconductors," J. Olive, W.H. Hofmeister, R.J. Bayuzick, J.P. McHugh, R. Hopkins, G. Carro, M. Vlasse; VIIIth European Symposium on

Materials and Fluid Sciences in Microgravity, Brussels, April, 1992. Poster presentation.

"Nucleation in Undercooled Metallic Melts," W.H. Hofmeister, R.J. Bayuzick, and M.B. Robinson; XXVIII COSPAR, The Hague, Netherlands, July, 1990.

"Low Gravity Materials Processing," W.H. Hofmeister, R.N. Grugel, and R.J. Bayuzick; ASM Materials Week, Indianapolis, IN, October, 1989.

"Experiments in Long Drop Tubes," W.H. Hofmeister, R.J. Bayuzick, and M.B. Robinson; Keynote Speaker, Third International Colloquium on Drops and Bubbles, Monterey, CA, September 18-21, 1988.

"Non-Contact Temperature Measurement of a Falling Drop," W.H. Hofmeister, R.J. Bayuzick, and M.B. Robinson; Tenth Symposium on Thermophysical Properties, NBS, Gaithersburg, MD, June 20-23, 1988.

"Containerless Processing of Spherically Shaped Alloys by Coupling Ground-Based Levitation Methods," W.H. Hofmeister and J.W. Williamson; AIAA 26th Aerospace Sciences Meeting, Reno, Nevada, January 11-14, 1988.

"Activities of the Vanderbilt Center for the Space Processing of Engineering Materials," W.H. Hofmeister and R.J. Bayuzick; SDIO/IST Third Pathways to Space Experimentation Workshop, Orlando, FL, June, 1987.

"Undercooling of Bulk High Temperature Metals in the 100 Meter Drop Tube," W.H. Hofmeister, M.B. Robinson and R.J. Bayuzick; Materials Research Society Fall Meeting, Boston, MA, December 1-6, 1986.

"Microstructures of Highly Undercooled Niobium-Germanium Alloys," W.H. Hofmeister, N.D. Evans, R.J. Bayuzick, and M.B. Robinson, Fall Meeting of TMS-AIME, Toronto, Ontario, October, 1985.

### **Book editing:**

Containerless Processing: Techniques and Applications, published by The Minerals, Metals and Materials Society, Warrendale, PA, 1993, with R. Shifman.

Gravity Dependent Phenomena in Fluids and Materials Science, published by Pergamon Press, Elsevier Science, 1993, with M.E. Glicksman and H.U. Walter.

Solidification 1998, published by The Minerals, Metals and Materials Society, Warrendale, PA, 1998, with numerous other editors.

Solidification 1999, published by The Minerals, Metals and Materials Society, Warrendale, PA, 1999, with numerous other editors.

### **Patents:**

"Method and Apparatus for Making Rapidly Solidified Metallic Particulate," U.S. Patent number 5,032,172, granted July 16, 1991. Co-holders: R.J. Bayuzick, R.A. Overfelt, D. Dillard, M.B. Robinson, M. Wells.

"Direct Laser Additive Fabrication System with Image Feedback Control," US Patent number 6,459,951, granted October 1, 2002. Co-holders: Michelle L Griffith, Gerald A Knorovsky, Danny O MacCallum, M. Eric Schlienger, John E Smugeresky.

"Direct Fabrication of Micro/Macro Scale Ceramics in Vacuum," US Patent number 6,555,180 granted April 29, 2003. Co-holders: Bridgett Rodgers and David Gustafson.

"Method and system for thick film deposition of ceramic materials," (PCT/US01/12952, No. 09/958,705) US Patent number 6,994,894 granted February 7, 2006.

"Capillary perfused bioreactors with multiple chambers," Wikswo; John P., Baudenbacher; Franz J., Prokop; Alex, Leboeuf; Eugene J., Chung; Chang Y., Cliffel; David, Haselton; Frederick R., Hofmeister; William H., Lin; Charles P., McCawley; Lisa J., Reiserer; Randall S., Stremmer; Mark A., US Patent number 7,534,601, granted May 19, 2009.

"Bioreactors with Substance Injection Capacity," JP. Wikswo, F.J. Baudenbacher, F. R.

- Haselton, W.H. Hofmeister, C.P. Lin, L.J. McCawley, M.A. Stremmer, and A. Weaver, United States Patent, 7,790,443 B2, granted September 7, 2010.
- “Capillary perfused bioreactors with multiple chambers,” Wikswa; John P., Baudenbacher; Franz J., Prokop; Alex, Leboeuf; Eugene J., Chung; Chang Y., Cliffel; David, Haselton; Frederick R., Hofmeister; William H., Lin; Charles P., McCawley; Lisa J., Reiserer; Randall S., Stremmer; Mark A., US Patent number 8,003,378 B2, granted August 23, 2011.
- “Use of Beam Deflection to Control an Electron Beam Wire Deposition Process,” K.M. Taminger, W.H. Hofmeister and R.A. Hafley, U.S. Patent Number 8,344,281 issued January 1, 2013.
- “Closed-Loop Process Control for Electron Beam Freeform Fabrication and Deposition Processes,” K.M. Taminger, R.A. Hafley, R.E. Martin, W.H. Hofmeister- US Patent 8,452,073, 2013.
- “Gated nanoneedles for intracellular electrodes and synthetic ion channels,” W. Hofmeister, L. Costa, A. Terekhov, filed with UTRF September 20, 2010. UTRF File No. PD 11020
- “Nanostructures from Laser-Ablated Nanohole Templates,” William Hudson Hofmeister, Alexander Yuryevich Terekhov, Jose Lino Vasconcelos Da Costa, Kathleen Stacia Lansford, Deepak Rajput, Lloyd M Davis; US Patent Application, 20,130,216,779, 2013.
- “OPEN MICROFLUIDIC DEVICES FOR CHEMOTAXIS, METHODS OF USING SAME, AND APPLICATIONS OF SAME,” Janetopoulos, Christopher; Wright, Gus; Hofmeister, William Hudson; Da, Vasconcelos; Lino, Costa Jose; Terekhov, Alexander; US Patent 20,140,308,207 , 2014..
- “Nanostructures from Laser-Ablated Nanohole Templates,” Hofmeister, William Hudson; Terekhov, Alexander Yuryevich; De Costa, Jose Lino Vasconcelos; Lansford, Kathleen Stacia; Rajput, Deepak; Davis, Lloyd M; US Patent Application 20,150,093,550 2014.

## **Organizations:**

- American Society for Metals (ASM International)
  - member Action in Education Team 1998-2001
- American Powder Metallurgical Institute
  - member Program Committee
  - member Industry Vision and Technology Roadmap Committee
- Laser Institute of America
- Microscopy Society of America
- Committee on Space Research, (COSPAR) (past member)
- Vice-chairman for materials processing , Commission G, 1991-1992.
- The Minerals, Metals, and Materials Society (TMS) 1992-2010, 2016
  - Journal of Metals editorial committee 1998-2001
  - Solidification Committee - Chairman 1995
- Advisor for ASM/TMS Student Chapter - Chapter of Excellence 1994
- Sigma Xi honor society
- Advisor for Vanderbilt Sailing Club 1987 - 1990.
- Faculty Advisor for Kappa Sigma Fraternity, 1995-2004
- Alpha Sigma Mu, honorary materials science student organization.
- Graduate Student Council 1983-1986, president 1984-1986.
- Vanderbilt Community Affairs Board 1984-1986.
- American Electroplaters Society 1978-1981, President, Miami branch, 1980-1981.

### **Conference organization:**

- Co-chairman with H. Walter and M.E. Glicksman for "Gravitation Effects in Fluids and Materials Science" joint COSPAR/IAF symposium held at the World Space Congress, August 30 - September 4, 1992, Washington, D.C.
- Organizer for "Containerless Processing - Techniques and Applications" symposium held at the annual TMS meeting February 21-25, 1993, Denver, Colorado.
- Member of Program Committee for 1993-1998, 2000-2010 Conference & Exhibition on Powder Metallurgy and Particulate Materials.
- Organizer for "Advancing Technology through Space Experiments," special symposium at 1998 International Conference & Exhibition on Powder Metallurgy and Particulate Materials, Las Vegas, Nevada.
- Co-Organizer of "Rapid Solidification: Modeling and Experiments" symposium at the TMS Annual Meeting, San Antonio, Texas, 1998
- Co-Organizer of "TEMPUS - Space processing of Metallic Melts" symposium at the TMS Fall Meeting, Chicago, Illinois, 1998.

### **Reviewer for:**

- Metallurgical Transactions
- Materials Research Society
- Materials Science and Engineering A
- Journal of Materials Science
- Journal of Applied Physics
- Applied Physics Letters
- Journal of Non-Crystalline Materials
- American Powder Metallurgical Institute
- Scripta Materialia
- Nanotechnology
- Intermetallics

### **Student Advising:**

- Deepak Rajpujt, Ph.D May 2013, MS December 2008.
- Matthew Parrish, MS August 2009.
- Co-advisor with Professor Bayuzick for the following students:
  - Paul Algosio, M.S. 1999, Ph.D. 2004
  - Alex Altgilbers, M.S. 1998, Ph.D. 2002
  - Melissa Wert, Ph.D. 2002
  - David Gustafson, M.S. 2000
  - James Olive, M.S. 1993, Ph.D. 1998
  - Brian T. Bassler, M.S. 1992, Ph.D. 1997
  - Craig Morton, M.S. 1992, Ph.D. 1997
  - Collin Anderson, M.S. 1987, Ph.D. 1991
  - Gerardo Bertero, M.S. 1989
  - Jeff Moore, M.S. 1990
- Co-advisor with Professor Wittig for the following students:
  - Timothy Miller, M.S., 2000
  - Milo Kral, Ph.D. 1996
  - David Sims, M.S. 1996

### **Courses Taught:**

- At University of Tennessee Space Institute:
  - MSE 511: Fundamentals of Materials Science and Engineering I
  - MSE 512: Fundamentals of Materials Science and Engineering II
  - MSE 515: Physical Metallurgy: Diffusion and Phase Transformations
  - MSE 500: Thesis

MSE 600: Doctoral Research and Dissertation  
MSE 503 Graduate Seminar  
MSE 676: Special Topics in Materials Science and Engineering: “All Things Carbon.”  
At Vanderbilt University:  
MSE 343: Seminar in Materials Science  
ES 101: Introduction to Materials – Freshman Seminar  
ES 130: Introduction to Computing for Engineers  
MSE 150: Introduction to Materials Science and Engineering  
MSE 232: Strength of Materials  
At University of Canterbury:  
ENME448: Advanced Materials and Processes

**Community Service:**

Board of Directors, Tullahoma Hands on Science Center 2007-2011, President 2010.  
Commodore of Harbor Island Yacht Club, 1992.  
Founder and Director of Sailing Camp at Harbor Island Yacht Club, 1989-2000.  
Recipient of Caldwell Service Award 1993 for lifetime service to HIYC.  
Coach for YMCA and West Nashville Athletic League basketball teams.  
Organizer of Vanderbilt “Hands on Science Fair” a program to bring elementary school students to  
Vanderbilt for science experiments related to their current curriculum.  
“Best of Fair” Judge for Middle Tennessee Science Fair  
Organizer of Teacher workshops for STEM disciplines.