James E. Smith

Professor

Department of Chemical & Materials Engineering

UAH Propulsion Research Center

Dr. James E. Smith Jr. is a Professor of Chemical Engineering for the University of Alabama in Huntsville since 1997. He specialties are Catalysis and Reaction Engineering; Combustion in Hypergolic and Hybrid Propulsion Systems; High Temperature Helical Ceramic Spring Manufacture and Performance Verification; Fiber Optic Chemical Sensing; Development of Intermetallic Compounds for Hydrogen Storage and Understanding Defect Density in Metals, Metal Composites and Plastic Materials and Their Processes and Applications. He had six experiments on five U.S. Space Shuttles and two on the Russian MIR Space Station studying defect density in Liquid Phase Sintered Composites Materials where he was principal scientist, lead engineer, developed fully automated space systems and interfacing with both the flight and ground crews.

Dr. James E. Smith Jr. has won various awards and honors for excellence in his field. Among these are two Group Achievement Awards for Discipline and Operations Teams for the MIR 21/NASA 2 presented by The Lyndon B. Johnson Space Center, the Appreciation Award from the City of Sao Jose dos Campos, Brazil, in 1997, the 1998 Outstanding Engineering Professor from the University of Alabama in Huntsville, the Distinguished Researcher Award from the University of Alabama in Huntsville Alumni Association in 2000 and The Gary Leach award for his work related to the safe application of plastic pipes and fittings. The Gray Leach award is granted by the Board of Directors of the American Institute of Chemical Engineers. Dr. James E. Smith Jr. is a senior member of American Institute of Chemical Engineers (AIChE) and a member of Society of Sigma Xi, American Chemical Society (ACS), American Society of Engineering Education (ASEE) and The Metals, Mining and Materials Society (TMS). He is also a member of the following Honor Societies**;** Phi Kappa Phi, Tau Beta Pi, and Omega Chi Epsilon.

He recently returns from a three month teaching assignment in China (May 7 to August 8, 2012) teaching his Undergraduate Controls Course in English to select undergraduate and graduate student as well as young faculty members. He was the first U.S. Professor not of Chinese decent invited and sponsored by the Shandong University's Controls Institute in Jinan China as part of a Chinese Initiative Program entitled "Curriculum Internationalization Program (CIP)" which was well received.

Contact Information:

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RELEVANT PUBLICATIONS:

1. *"Reaction Rates for Hypergolic Propellants Using Chemical Delay Time," with M. Farmer, L. O. Mays, and C. S. Hampton,* AIAA Journal of Propulsion and Power, , 20(2), pp 372-376, 2004.
2. "*The Importance of Carbon, Nitrogen, and Oxygen Atomic Ratios on the Combustion of Hypergolic Bipropellants,*" with C. Hampton, AIAA Paper 2005-740, AIAA 43rd Aerospace Sciences Meeting and Exhibit, Reno, NV, January 2005.
3. *"The Relationship Between the Chemical Delay Time and Temperature for Hypergolic Bipropellants,"* with R. Dasarathy and C. Hampton, 53rd JANNAF Propulsion Meeting/2nd Liquid Propulsion Subcommittee, Monterey, CA, December 2005.
4. *"Kinetic Modeling and Mass Transfer Effects below the Freezing Point for the Hypergolic Combustion of Anhydrous Hydrazine Reacted with Red Fuming Nitric Acid,"*. with C. Brown and P. Frisby, Paper # 523, Proceedings of 56th JANNAF Propulsion Meeting, 35th Propellant and Explosives Development and Characterization Subcommittee, Las Vegas, Nevada April 14-17, 2009.
5. *"The Use of Cryogenic Temperatures to Study High Oxidizer to Fuel Ratios in the UDMH/RFNA System,"* with C. Brown and P. Frisby, Paper # 521, Proceedings of 56th JANNAF Propulsion Meeting, 35th Propellant and Explosives Development and Characterization Subcommittee, Las Vegas, Nevada April 14-17, 2009.
6. *"The Thermal Performance and Kinetic Behavior of Monomethylhydrazine Reacted with Red Fuming Nitric Acid,"* with P. Frisby and C. Brown, Paper # 522, Proceedings of 56th JANNAF Propulsion Meeting, 35th Propellant and Explosives Development and Characterization Subcommittee, Las Vegas, Nevada April 14-17, 2009.
7. *"Hypergolic Green Fuel Development and Testing,"* V. Zankich and H. Murfee, Northrop Grumman Aerospace Systems, Redondo Beach, California, James Smith Jr., University of Alabama in Huntsville, Huntsville, Alabama and Greg Ogden, Ogden Engineering & Associates, LLC, Tucson, Arizona, Proceedings of at the 57th JPM, 5th LPS Subcommittee of the JANNAF Meeting, Colorado Springs, CO. May 6, 2010.
8. *"The Importance of the Chemical Delay Time in Understanding Hypergolic Bipropellant Ignition."* with Dasarathy, R. B., Hampton, C.S., Brown, C.J., Frisby, P.M., Bennett, G.S., JANNAF Journal of Propulsion and Energetics, Vol. 4 (1), pp 47-69, 2011.