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Principal Director, Space Materials Laboratory  
The Aerospace Corporation  
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Experience:

Principal Director, Space Materials Laboratory The Aerospace Corporation Nov 2013 to Present  
Responsible for an active experimental Laboratory focused on different aspects of space materials and advanced processes. The Laboratory consists of ~ 100 staff divided into 4 Departments; Materials Science, Surface Science, Propulsion Science, and Materials Processing.

Director, Materials Science Department The Aerospace Corporation Nov 2007 to Nov, 2013  
Responsible for a staff of 20 that are committed to meeting the materials development and characterization needs of National Security Space programs. Manage a diverse portfolio of research programs that includes work with nanocomposites, characterization of ceramic rolling elements, adhesive bonding, and manufacturing of high performance composite structures.

Sr. Program Engineer, Systems Architecture Studies Dept. Dec 2005 to Nov 2007  
Efforts focused on remote sensing techniques and sensors and incorporating these elements into advanced system architectures.

Sr. Scientist, Research and Program Development Office, Feb 2003- Dec 2005  
Managed the Aerospace Internal Research and Development portfolio with a budget of ~ \$14M that funded over 100 projects of different scope

Section Manager, Materials Physics and NDE, 1999 – 2003  
7 direct reports in addition to providing hands-on nondestructive inspection support for government customers

MTS, Materials Physics and NDE, 1992-1999  
Expert in Ultrasonics, Thermography and Interferometric inspection techniques

MTS, The Atlantic Research Corporation, Gainesville, VA, 1985-1987,  
Structural analysis of small solid rocket motors

Patents Awarded:

Zaldivar, R. et al., "Carbonaceous nano-scaled materials having highly functionalized surface." Patent 8,916,067. 23 December 2014.

Tockstein, M. et al., "Radio frequency transparent thermal window." Patent 8,904,887. 9, December 2014

Zaldivar, R. et al., "System and method for measuring glass transition temperature." Patent 8,858,070. 14 October 2014.

Zaldivar, R. et al., "Hybrid adhesive." Patent 8,551,287. 8 October 2013.

Zaldivar, R. et al., “Glass transition temperature measurement system.” Patent 6,425,686. 8 October 2013.

Hawkins, G. et al., “Wheeled large surface thermographic inspection heating apparatus with uniform heating.” Patent 6,400,898. 4 Jun 2002.

Chang, D. et al., “Microballoon impregnated fiber reinforced RTV film compression stress.” Patent 5,814,734. 29 September 1998.

Chang, D. et al., “Microballoon impregnated fiber reinforced RTV film compression stress sensor testing method.” Patent 5,808,207. 15 September 1998.

2002 Aerospace Presidents Distinguished Achievement award for the development of an inspection technique for bonded solar cell arrays

2014 Aerospace Innovation Award for a patented technique that uses plasma to prepare a composite surface for bonding

#### Publications:

Author or Co-Author of over 45 papers and presentations related to composite materials, nondestructive inspection, and additive manufacturing technologies

#### Recent Publications

- 1) Zaldivar, R. J., Patel, D., Labatete, A., Nokes, J.P., “The Effect of Radiation Exposure on the Mechanical Behavior of Rohacell Foam Core Sandwich Composite Structures”, accepted and in press in *Journal of Polymer Composites*, 9/2016
- 2) Zaldivar, R. J., Patel, D., Labatete, A., Nokes, J.P., “The Effect of Co60 Radiation Exposure on the Mechanical Performance of Rohacell Foam”, (Invited publication) in press *SPIE Plastics Online*, (9/2016)
- 3) “Mechanical enhancement of graphite nanoplatelet composites: Effect of matrix material on the atmospheric plasma-treated GnP reinforcement,” Rafael J. Zaldivar, Paul Adams, Hyun. I. Kim, and James P. Nokes, *Journal of Composite Materials*, June 2015, DOI: 10.1177/0021998315573285
- 4) Zaldivar, R., J., Kim, H.I. and Nokes, J. P., The Effect of Surface treatment on GNP used in fiber reinforced Composites, *J. Applied Polymer Sci.*, Nov. 2013, DOI: 10.1002/app.39994
- 5) Nondestructive Inspection of Sandwich Structures for Space Applications, J.P. Nokes, Bernardo Higuera, Oscar Esquivel, Yong M Kim, Rachel Morford, Accepted *SAMPE Conference Proceeding*, May, 2013
- 6) Nondestructive Evaluation Techniques to Ensure Mission Success”, O. Esquivel, J. P. Nokes, Y. M. Kim, “, 27<sup>th</sup> Aerospace Testing Seminar, Los Angeles, CA, 16 October 2012.
- 7) Effect of Using Oxygen, Carbon Dioxide, and Carbon Monoxide as Active Gases in the Atmospheric Plasma Treatment of Fiber-Reinforced Polycyanurate Composites, R. J. Zaldivar, J. P. Nokes, D. N. Patel, B. A. Morgan, G. L. Steckel, and H. I. Kim, *Journal of Applied Polymer Science*, 125 (2012) 2510–2520

- 8) Effect of Abrasion Surface Treatment on the Bonding Behavior of Various Carbon-Fiber-Reinforced Composites, R.J Zaldivar, HI Kim, GL Steckel, JP Nokes, DN Patel, *Journal of Adhesion Science and Technology*, 26 (2012) 1573-1590
- 9) Bonding Optimization of Composite Surfaces Using Atmospheric Plasma Treatment, R.J. Zaldivar, G.L. Steckel, B.A. Morgan, J.P. Nokes and H.I. Kim, *Journal of Adhesion Science and Technology* 26 (2012) 381-401
- 10) Surface functionalization without lattice degradation of highly crystalline nanoscaled carbon materials using a carbon monoxide atmospheric plasma treatment, R.J. Zaldivar, J.P. Nokes, P.M. Adams, K. Hammoud, H.I. Kim, *Carbon* 50 (2012) 2966-2975
- 11) Surface functionalization of graphene like materials by carbon monoxide atmospheric plasma treatment for improved wetting without structural degradation, R. J. Zaldivar, P.M. Adams, J. Nokes, and H.I. Kim, *J. Vac. Sci. Technol. B* 30 (2012) 03D107
- 12) Mechanical and Chemical Effects of Atmospheric Plasma Treatment on Fiber-Reinforced Composites for Adhesive Bonding”, R. J. Zaldivar, G.L. Steckel, B.A. Morgan, J.P. Nokes, and H.I. Kim, Paper published in the Proceedings of the 15<sup>th</sup> European Conference on Composite Materials, June 27, 2012, Venice, Italy, 6-12
- 13) Manufacturing Problem Prevention Program (MP3) Meeting, June 5, 2012, El Segundo, CA “Non-Damaging Carbon Monoxide Plasma Treatment of Carbon Materials” H.I. Kim, J.P. Nokes and R. J. Zaldivar.
- 14) 15<sup>th</sup> European Conference on Composite Materials, June 27, 2012, Venice, Italy “Mechanical and Chemical Effects of Atmospheric Plasma Treatment on Fiber-Reinforced Composites for Adhesive Bonding”, R. J. Zaldivar, G.L. Steckel, B.A. Morgan, J.P. Nokes, and H.I. Kim
- 15) 1<sup>st</sup> International Symposium on Joining Technologies for Composites, June 11, 2012, Costa Mesa, CA “Atmospheric Plasma Treatment of Fiber Reinforced Composites for Adhesive Bonding,” R. J. Zaldivar, G.L. Steckel, B.A. Morgan, J.P. Nokes, and H.I. Kim
- 16) Surface Preparation for Adhesive Bonding of Polycyanurate-based Fiber-reinforced Composites using Atmospheric Plasma Treatment, R. J. Zaldivar, H. I. Kim, G. L. Steckel, D. Patel, B. A. Morgan and J. P. Nokes, *Journal of Applied Polymer Science*, Vol. 120, Issue 2, pages 921–931, 15 April 2011.
- 17) Effect of Isopropanol Rinse on Adhesion of Plasma-Treated Epoxy Carbon-Fiber-Reinforced Composites, Morgan, Zaldivar, Kim, Steckel, Chaney, Nokes. *Journal of Composite Materials*, Vol. 45, Issue 12, pp. 1331 - 1336, June 2011.
- 18) Atmospheric Plasma as a Surface Treatment Technique for Bonding Composite Materials, J.P. Nokes, H. I. Kim, B. Morgan, R.J. Zaldivar, *SAMPE Conference Proceeding*, May, 2011
- 19) 34<sup>th</sup> Annual Meeting of The Adhesion Society, February 13-16, 2011, Savannah, GA, “Atmospheric Plasma as a Surface Treatment Technique for Bonding Composite Materials” H. Kim, B. A. Morgan, G. L. Steckel, J. Nokes, and R. J. Zaldivar
- 20) Manufacturing Problem Prevention Program (MP3) Meeting, Oct, 21,2008, El Segundo, CA “Bonding of Composite Materials Utilizing Atmospheric Plasma for Surface Preparation,” J.P. Nokes, Rafael J Zaldivar, Gary L Steckel, Hyun I Kim, Brent A Morgan

#### Education:

Ph.D., Engineering Mechanics, Michigan State University, 1991  
 MS, Mechanical Engineering, Michigan State University, 1985  
 BS, Mechanical Engineering, Michigan State University, 1982