ALBERT E. SEGALL
Professor of Engineering Science and Mechanics
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EDUCATION

Ph.D. in Engineering Science and Mechanics, The Pennsylvania State University, 1990-1992
MS in Engineering Mechanics, The Pennsylvania State University, 1982-1986
BS in Mechanical Engineering, The Pennsylvania State University, 1977-1982

ACADEMIC, RESEARCH, & ADMINISTRATIVE EXPERIENCE

2002-Present **The Pennsylvania State University, University Park, PA.**

Outstanding Teaching Award (2015)

Outstanding Advising Award (2013)

Fellow, Society for Tribologists and Lubrication Engineers (2013)

Associate Editor of ASME Pressure Vessel Technology (2012-2017)

Fellow, American Society of Mechanical Engineers (2010)

Professor, Engineering Science and Mechanics (2008-present)

Director of Graduate Programs, Engineering Science and Mechanics (2008-2015, 2020-Present)

Distinguished Visiting Professor at the American University in Cairo (2007)

Associate Professor, Engineering Science and Mechanics (2002-2008)

Interim Chair of the Intercollege Graduate Program in Materials (2004-2006)

Associate Editor of STLE Tribology Transactions (2005-present)

Black Belt, Tae Kwon Do (2nd Dan - 2018)

1999-2002 **Washington State University Vancouver, Vancouver, WA.**

Director (equivalent to Chair/Assistant Dean) of Engineering Programs (2000-2002)

Associate Professor, Mechanical and Manufacturing Engineering (Tenured 2002)

1987-1999 **The Pennsylvania State University, University Park, PA.**

Senior Research Associate, Manufacturing and Materials Science Department, Applied Research Laboratory (1996-1999)

Associate Director, Center for Advanced Materials (1994-1996)

Research Assistant/Associate, Center for Advanced Materials (1987-1994)

1984-1986 **CFC (DOE Funded Research Lab), State College, PA,** Stress-Analyst/Modeler

INDUSTRIAL EXPERIENCE

1986-1987 **Boeing Helicopter Company, Philadelphia, PA,** Stress Analyst

1981-1981 **Westinghouse Steam Turbine Division, Lester, PA,** Design Engineer (Summer Intern)

BROAD ENGINEERING INTERESTS
Forensic failure analysis. Stress analysis, probabilistic fracture mechanics and brittle-design methodologies and their application to thermal shock and laser machining. Wear, friction, coatings, and the development of realistic tribotest methodologies. Manufacturing. Computational design and analysis including finite-element methods. Engineering education including the implications of science, technology, and society.

RESEARCH ACTIVITIES: Dr. Segall's research has focused on two often overlapping areas that involve the response of materials/surfaces to severe conditions and wear (tribology). Most notably, this research included an NSF CAREER investigation of the laser machining of ceramics that has led to the new concept of "Active Stressing" where complex thermoelastic states are precisely manipulated both spatially and temporally to influence fracture probabilities; this research involves complex numerical simulations of the transient stress-states during ablation and the response of the stochastic micro-flaw populations of brittle materials. The dual-beam studies have also resulted in innovations for faster manufacturing and the joining of ceramics. Dr. Segall's research in tribology includes the study of friction and wear modes at various scales, the development of realistic tribotest methods to capture these behaviors that has resulted in the creation of a new class of self-lubricating and micro-porous coatings using Cold-Spray methods. In recognition of these and other accomplishments, Professor Segall was named a Fellow of ASME and STLE, a Distinguished Visiting Professor at the American University in Cairo, invited to author chapters on thermal-stresses (UNESCO Encyclopedia of Life support Systems) and Science Fiction in Engineering Education, was named an Associate Editor of the refereed Journal of Pressure Vessel Technology (ASME) and Tribology Transactions (STLE), published 122 technical papers, and has given 198 presentations including many that were invited or Keynotes. Dr. Segall was the Interim Chair of the Intercollege Graduate Degree Program in Materials (2004-2006) and continues to be actively involved in curriculum development and the expansion of materials and mechanics research.

EDUCATIONAL ACTIVITIES: Dr. Segall's goal as an educator is to help the students learn relevant theories and their implications for the varied situations that will inevitably occur in engineering practice at the industrial and academic (research) level. Accordingly, his overall approach to teaching is to provide a strong fundamental background in the underlying theories of mechanics, design, and forensic failure-analysis methodologies followed by examples and/or projects involving practical applications and usage. To facilitate this approach, Professor Segall integrates "real world" applications, historical anecdotes, experiences, and his research throughout the curriculum so that the students can see the theory in practice. Dr. Segall has developed a graduate course on Thermal-Stress Analysis (E MCH 536) that covers pertinent aspects of thermoelasticity and its application to safe design. Moreover, he has taught and improved courses on advanced strength of materials (E MCH 400) and Solid Mechanics (E MCH 500), and the honors level E MCH 416H on failure analysis. Since rejoining Penn State, Dr. Segall has taught and helped coordinate E MCH 315 (and related 316 lab) covering the mechanical response of materials and significantly revised the course and lab texts originally authored by the late Dr. Richard Queeney. To help teach basic engineering concepts, create positive attitudes about engineering, and to explore the societal implications of engineering practice, Professor Segall has also developed a unique way to mix science fiction and current research efforts in a popular first-year seminar. *By using innovative teaching methods, relevant course topics, interactive PowerPoint notes, and continuously assessing each class, Professor Segall has endeavored to shift towards a more complete understanding of analytical procedures, materials behaviors, design, and the societal implications of engineering.*

PROFESSIONAL SERVICE: Dr. Segall was an Associate Editor of the ASME Journal of Pressure Vessel technology for 6 years and is still with STLE Tribology Transactions, and has also has served as a reviewer for the National Science Foundation, Civilian Research and Development Foundation, the Israeli Science Foundation, the ASME Journals of Pressure Vessels and Piping, Tribology, Heat Transfer, Mechanical Design, and Engineering for Industry, the Journal of the American Ceramic Society, the Journal of Laser Applications, the ASTM Journal of Testing and Evaluation, Experimental Mechanics, and two ASME Biennial Conference proceedings. Additionally, he authored an ASTM Standard (C1323) on the use of C-Ring specimens for evaluating the strength of ceramics in tubular form. Professor Segall is also actively involved as a co-organizer, paper solicitation chair, and session-chair with the Tribotesting committee of STLE, a symposia organizer/session-chair for various meetings of the Society of Engineering Science, and a session co-organizer/chair for symposia of the Design and Analysis committee of the ASME Pressure Vessel & Piping Division. Finally, Dr. Segall has consulted extensively to government and industry on failure analysis, design and safety, thermal shock and heat conduction, inverse methods, temperature measurements, and wear/tribology.

PROFESSIONAL AND HONORARY SOCIETIES

American Society of Mechanical Engineers (ASME)
Society of Tribologist and Lubrication Engineers (STLE)
Tau Beta Pi Engineering Honor Society

INDUSTRY CONSULTING ACTIVITIES (Sampling sans litigation cases)

Army Research Lab, Aberdeen, MD
Alpha Sintered Metals, Ridgeway, PA
Benet Labs, Watervilet, NY
Boeing (Phantom Works), Seattle, WA
BTU Inc., Billerica, MA
Carbone, St. Mary's, PA
Element Six, South Africa
E^2G, Cleveland, Ohio
Ferro Corporation, Cleveland, OH
Foseco Corporation, Cleveland, OH
GE (Aircraft Engine), Cincinnati, OH
Lanxide Corporation, Newark, DE
MER Corporation, Pheonix, AZ
Mersen Corporation, St. Mary's, PA
Micropump, Vancouver, WA
North American Refractories, State College, PA
Rolls Royce Ltd., Loughborough, UK
Royce Manufacturing Inc., Pittsburgh, PA
Surface Combustion Inc., Maumee, OH
Thermotrex Corporation, San Diego, CA
Westinghouse (STC), Pittsburgh, PA
Windfall Products Inc., St. Marys, PA
Xtreme machining, Grassflat, PA

AWARDS

1. Departmental First Prize for Graduate Research Exhibition to: C.A. Moose, E.J. Voorhees, and P.C. De Bellis co-authored/advised by J.R. Hellmann, R.E. Tressler, and A.E. Segall for their entry: "Thermal Shock Test Methodology for Ceramic Tubes," March 31-April 1, 1989.

1. ASTM Committee C-28 on Advanced Ceramics Award of Appreciation to: A.E. Segall for the development of Standard C1323, "Ultimate Strength of Advanced Ceramics with Diametrally Compressed C-Ring Specimens at Ambient Temperature," January 1997.

2. Penn State Engineering Alumni Society (PSEAS) Outstanding Advising Award, 2013.

3. ESM Today 1st Prize for Poster by PhD student Maryam Neshastehriz, "Self-Lubricating Ni-Encapsulated Hexagonal Boron Nitride Coatings via Cold-Spray," 2013.

4. College of Engineering Research Symposium Paper Review Award by PhD student Maryam Neshastehriz, "Cold Spray Coating on Aluminum Substrates with Nickel Encapsulated Lubricant Particles," 2013.

5. Penn State Engineering Alumni Society (PSEAS) Outstanding Teaching Award, 2015.

INVENTIONS AND PATENTS

1. L.B. Kriksunov, D.D. Macdonald, and A.E. Segall, "A New Device for NO_x Sensing, NO_x Mitigation, and *In Situ* Flame Control," PSU Invention Disclosure No. 951-1538.

2. A.E. Segall, "A Scoring Process for the Improvement of Laser Machining of Ceramics," WSURF Invention Case No. 537.

3. A.E. Segall, "A Hand-held to MEMs Scale System for Field Evaluations of Lubricity," Under development.

PUBLICATIONS BY A.E. SEGALL

Articles in Refereed Journals

1. H.P. Kirchner, J.C. Conway, Jr., and A.E. Segall, "Effect of Joint Thickness and Residual Stresses on the Properties of Ceramic Adhesive Joints: I, Finite-Element Analysis of Stresses in Joints," *Journal of the American Ceramic Society*, 70 [2], pp. 104-109, February 1987.

2. A.E. Segall and J.C. Conway, Jr., "Scattered-Light Analysis of a Surface-Flawed Plate Subjected to Cylindrical Bending," *Experimental Mechanics*, 27 [3], pp. 64-67, March 1987.

3. A.E Segall and J.C. Conway, Jr., "Scattered-Light Determination of Mode I Stress-Intensity Factors by a Fringe Gradient Independent Technique," *Experimental Mechanics*, 30 [2], pp. 173-176, June 1990.

4. A.E. Segall, J.R. Hellmann, and P. Strzepa, "Experimental and Analytical Evaluation of the Mechanical Performance of a Gas-Fired Ceramic Radiant Tube at Steady-State," *ASTM Journal of Testing and Evaluation*, 18 [4], pp. 250-255, July 1990.

5. A.E. Segall, J.R. Hellmann, and M.F. Modest, "Analysis of Gas-Fired Ceramic Radiant Tubes during Transient Heating: Part I-Thermal Transient Modeling," *ASTM Journal of Testing and Evaluation,* 19 [6], pp. 454-460, November 1991.

6. A.E. Segall and J.R. Hellmann, "Analysis of Gas-Fired Ceramic Radiant Tubes during Transient Heating: Part II-Thermoelastic Stress Analysis," *ASTM Journal of Testing and Evaluation*, 20 [1], pp. 25-32, January 1992.

7. A.E. Segall, "Instrumentation Techniques for Ceramic Radiant Tubes," *Experimental Techniques*, 16 [2], pp. 36-41, March/April 1992.

8. A.E. Segall, "Corrective Solutions for Intrinsic Thermocouples under Polynomial Substrate Loading," Technical Note in the *ASME Journal of Heat Transfer,* 116 [3], pp. 759-761, August 1994.

9. J.A. Kostic, A.E. Segall, J.C. Conway, Jr., and M. Amateau, "The Sliding Wear Behavior of Cobalt-Based Hardfacing Alloys Used in Steam Valve Applications," *STLE Tribology Transactions,* 40 [1], pp. 168-172, January 1997.

10. A.E. Segall, "Correction Functions for a Wide Range of Measured Substrate Temperature Histories," Technical Note in the *International Journal of Heat and Mass Transfer,* 40 [10], pp. 2482-2485, July 1997.

11. A.E. Segall, D.L. Shelleman, M.J. Pan, R.A. Landy, and B.R. Nelson, "A Probabilistic Study of the Influence of Metal Hanger Alignment on the Reliability of Refractory Furnace Roof Anchors," *ASTM Journal of Testing and Evaluation.* 26 [2], pp. 138-143, March 1998.

12. V.R. Vedula, A.E. Segall, and S.K. Rangarazan, "Transient Analysis of Internally Heated Tubular Components with Exponential Thermal Loading and External Convection," Technical Note in the *International Journal of Heat and Mass Transfer*, 41 [22], pp. 3675-3678, August 1998.

13. A.E. Segall, C. Tricou, M. Evanko, and J.C. Conway, Jr., "Localized Autofrettage as a Design Tool for the Fatigue Life Improvement of Cross-Bored Cylinders," *ASME Journal of Pressure Vessel Technology,* 120 [4], pp. 393-397, November 1998.

14. V.R. Vedula, D.J. Green, J.R. Hellmann, and A.E. Segall, "Test Methodology for the Thermal Shock Characterization of Ceramics," *Journal of Materials Science,* 33, pp. 5427-5432, 1998.

15. A.E. Segall, J.C. Conway, Jr., C.A. Moose, D. Stiver, III, and S. Hershman, "Elevated Temperature Fretting Evaluations Using a Flat-On-Flat Configuration," *STLE Tribology Transactions*, 42 [3], pp. 681-685, July 1999.

16. A.J. Freimanis, A.E. Segall, J.C. Conway, Jr., and E.J. Whitney, "Elevated Temperature Evaluation of Fretting and Metal Transfer between Coated Titanium Components," *STLE Tribology Transactions*, 43 [4], pp. 653-658, October 2000.

17. A.E. Segall, "Thermoelastic Analysis of Thick-Walled Vessels Subjected to Transient Thermal Loading," *ASME Journal of Pressure Vessel Technology,* 123 [1], pp. 146-149, February 2001.

18. R.W. Goldman, A.E. Segall, and J.C. Conway, Jr., "The Dry Sliding Behavior of Aluminum Alloys against Steel in Sheave Wheel Applications," *ASME Journal of Tribology*, 123, [4], pp. 676-681, October 2001.

19. A.E. Segall, "Solutions for the Correction of Temperature Measurements Based on Beaded Thermocouples," *International Journal of Heat and Mass Transfer*, 44 [10], pp. 2801-2808, July 2001.

20. A.E. Segall, "Relationships for the Approximation of Transient Direct and Inverse Problems with Asymptotic Kernels," *Inverse Problems in Engineering*, 9 [2], pp. 127-140, 2001.

21. A.E. Segall, "Failure of a Continuous Fiber Ceramic Composite after Exposure to Combustion Ambients," *Engineering Failure Analysis*, 9 [4], pp. 469-479, August, 2002.

22. A.J. Freimanis, A.E. Segall, J.C. Conway, Jr., and E.J. Whitney, "The Influence of Temperature on the Wear Mode and Deterioration of Coatings Used for Titanium Aircraft Engine Components," *STLE Tribology Transactions*, 45 [2], pp.193-198, 2002.

23. M.J. Sipics, A.E. Segall, and J.C. Conway, Jr., "Evaluation of the Uniaxiality of the Stress State in O-Ring Fracture Strength Specimens," *ASTM Journal of Testing and Evaluation,* 30 [2], pp. 118-123, March 2002.

24. A.E. Segall, "Useful Polynomials for the Transient Response of Solids under Mechanical and Thermal Excitations," *International Journal of Mechanical Sciences,* 44 [4], pp. 809-823, 2002.

25. A.E. Segall, "Science Fiction in the Engineering Classroom to Help Teach Basic Concepts and Promote the Profession," *Journal of Engineering Education,* 91 [4], pp. 419-423, October, 2002.

26. C.H. Hager, Jr., A.E. Segall, J.C. Conway, Jr., H. Dang, and M.F. Amateau, "Evaluation of the Reciprocating-Wear Behavior of Unlubricated Hypereutectic Al-Si Alloys," *STLE Tribology Transactions,* 46 [2], pp. 206-210, April, 2003.

27. A.E. Segall, "Thermal Stresses in an Infinite Slab under an Arbitrary Thermal Shock," Technical Note in *ASME J. Applied Mechanics,* 70, pp.779-782, September, 2003.

28. A.E. Segall, "Transient Analysis of Thick-Walled Piping under Polynomial Thermal Loading," *Nuclear Engineering Design,* 226 [3], pp. 183-191, December 2003.

29. T. Embree and A.E. Segall, "Evaluation of the Uniaxiality of the Stress State in C-Ring Fracture Strength Specimens," *ASTM Journal of Testing and Evaluation,* 32 [2], pp. 153-160, March 2004.

30. A.E. Segall and M.J. Sipics, “The Influence of Interpolation Errors on Finite-Element Calculations Involving Stress-Curvature Proportionalities,” *Finite-Elements in Analysis and Design*, 40, [13-14], pp. 1873-1884, August, 2004.

31. A.E. Segall, “Thermoelastic Stresses in an Axisymmetric Thick-Walled Tube under an Arbitrary Internal Transient,” *ASME Journal of Pressure Vessel Technology*, 126 [3], pp. 327-332, August 2004.

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32. R. Akarapu, B.Q. Li, and A.E. Segall, “A Thermal Stress and Failure Model for Laser Cutting and Forming Operations,” *ASM Practical Failure Analysis,* 4 [5], pp. 51-62, October 2004.

33. A.E. Segall, G. Cai, R. Akarapu, A. Romasko, and B.Q. Li, “Fracture Control of Unsupported Ceramics during Laser Machining using a Simultaneous Prescore," *Journal of Laser Applications*, 17 [1], pp. 57-62, February, 2005.

34. V. Pereles-Santiago, M. Washington, A.E. Segall, P. Brugan, G. Cai, R. Akarapu, and S. Pulford, “Faster and Damage-Reduced Laser-Cutting of Thick Ceramics using a Simultaneous Prescore Approach,” Journal of Laser Applications, 17, [4], pp. 219-224, November, 2005.

35. A.E. Segall, "Inverse Solutions for Determining Arbitrary Boundary-Conditions using a Least-Squares Approach," *ASME Journal of Heat Transfer*, Volume 127, pp. 1403-1405, December 2005.

36. A.E. Segall, "Manufacturing Defects and the Evidence of Thermomechanical Fatigue in a Ceramic Vacuum Furnace Tube,” Engineering Failure Analysis, 13, pp. 1184-1190, 2006.

37. A.E. Segall, “Thermoelastic Stresses in Thick-Walled Vessels under an Arbitrary Thermal Transient via the Inverse Route,” ASME Journal of Pressure Vessel Technology, 128 [4], pp. 599-604, November 2006.

38. S.E. Schoenberg, G.L. Messing, A.E. Segall, A.S. Grader, P.M. Halleck, and D.J. Green “Stresses and Distortion Due to Green Density Gradients, II: Density Characterization and Stress Analysis,” Journal of the American Ceramic Society, 89 [10] pp. 3027-3033, 2006.

39. P. Brugan, G. Cai, R. Akarapu, and A.E. Segall, “Controlled-Fracture of Prescored Alumina Ceramics using Simultaneous CO_2 Lasers,” Journal of Laser Applications, 18, [3], pp. 236-241, August 2006.

40. R. Akarapu and A.E. Segall, “Investigation of an Active-Stressing Technique for Delaying Fracture during Cutting of Alumina,” *ASME Journal of Manufacturing Science and Engineering*, 128 [4], pp. 921-927, November, 2006.

41. J.E. McConnell, A.E. Segall, and T.J. Eden, “The Dry Sliding Behavior of Al_2O_3 Transformed, Hypereutectic, 2xxx, and 7xxx, Aluminum Alloys under Simulated Wire–Rope Induced Wear,” STLE Tribology Transactions, 49, pp. 1-11, October, 2006.

42. A.E. Segall, G. Cai, and R. Akarapu, “Studies on the use of Offset and an Angled Prescores for Fracture Control during Laser Machining of Alumina Ceramics,” Journal of Laser Applications, 18 [4], pp. 325-329, November, 2006.

43. O.M. Jadaan, N.N. Nemeth, and A.E. Segall, “Time-Dependent Reliability of Thermally Shocked SiC Tubes,” *ASTM Journal of Testing and Evaluation* 35, [1]**,** pp. 75-84, January 2007

44. A.E. Segall and R. Akarapu, “Approximate Direct and Inverse Relationships for Thermal and Stress-States in Thick-Walled Vessels under Thermal Shock,” *ASME Journal of Pressure Vessel Technology*, 129 [1] pp. 52-57, February, 2007.

45. A.E. Segall and J. Meeker, "Mode-I Stress-Intensity Factors for a Cracked Slab under an Arbitrary Thermal-Shock," *ASME Journal of Pressure Vessel Technology*, 129 [2], pp. 306-312, May, 2007.

46. C. Knepper and A.E. Segall, "Analytical Method for the Inverse Determination of Interfacial Wear Temperatures," *STLE Tribology Transactions,* 50 [4], pp. 523-530, October-December, 2007.

47. W.G. Luscher, J.R. Hellmann, A.E. Segall, and D.L. Shelleman, "A Critical Review of the Diametral Compression Method for Determining the Tensile Strength of Spherical Aggregates," *ASTM Journal of Testing and Evaluation*, 35, [6], pp. 624-629, https://doi.org/10.1520/JTE100793. ISSN 0090-3973, 2007.

48. J. Meeker, A.E. Segall, and E. Gondar "An Inverse Method for the Determination of Thermal Stress-Intensity Factors under Arbitrary Thermal-Shocks," *ASME Journal of Pressure Vessel Technology*, 130 [4], pp. 041206-1-041206-8, November, 2008.

49. R. Akarapu and A.E. Segall, "Active Stressing and the Micro-Manipulation of Stress-States for Delaying Fracture during Unsupported Laser Cutting," *ASME Journal of Manufacturing Science and Engineering*, 130 [4], pp. 061004-1-061004-10, December 2008.

50. A.E. Segall, D. Engels, and A. Hirsh "Transient Surface Strains and the Deconvolution of Thermoelastic States and Boundary Conditions," *ASME Journal of Pressure Vessel Technology*, 131 [1], pp. 011201-1-011201-9, February, 2009. **Note: Made Top 10 Most Downloaded Articles -- December 2008.**

51. C.H. Hager, Jr., J. Sanders, S., Sharma, A. Voevodan, and A.E. Segall, "The Effect of Temperature on Gross-Slip Fretting Wear of Cold Sprayed Nickel Coatings on Ti6Al4V Interfaces," *Tribology International*, 42, pp. 491-502, 2009.

52. J. Meeker, A. E. Segall, and V.V. Semak, "Surface Effects of Alumina Ceramics Machined with Femto-Second Lasers", *Journal of Laser Applications*, 22, [1], pp. 7-12, February 2010**.**

53. J. Harris, R. Akarapu, and A. E. Segall, "Welding of Alumina Using a Pulsed Dual-Beam CO_2 Laser," ASME Journal of Manufacturing Science and Technology, 133 [1], pp. 011001-1-011001-6, 2011.

54. A. Segall and J. Meeker*, "Boundary-Conditions, Temperatures, and Stress-Intensity Factors under Arbitrary Thermal Transients via the Inverse Route" Journal of Nuclear Engineering and Design (SMiRT 19 Special Issue), 241, pp. 625-629, 2011

55. J. Harris*, A.E. Segall, J.R. Hellmann, B. Scheetz, R. Koseski, and J. Boyce, "Experimental and Finite-Element Analysis of the API RP60 Test," ASTM Journal of Testing and Evaluation, 39 [3], pp. 436-441, 2011.

56. J. Harris*, A.E. Segall, and R. Carter, "Severe Thermal and Pressure Transients on the Survival of Internally Coated Tubes with Interface Defects," Journal of Materials, and Manufacturing Processes, 27, pp. 852-859, 2012.

57. A.E. Segall, "Inverse Determination of Interfacial Wear Temperatures with a Receding Boundary and the Implications for Tribotesting," *Tribology Transactions,* 55 [1], pp. 130-139, January-February, 2012.

58. I. Smid, A. Segall, G. Aggarwal*, P. Walia*, J Weyant*, T. Eden, J. Potter, and C. Hager, "Cold-Sprayed Ni-hBN Self-Lubricating Coatings," *Tribology Transaction,* 55*,* pp. 599-605, 2012.

59. L. Stark*, I. Smid, A.E. Segall, T. Eden, and J. Potter, "Self-lubricating Cold-Sprayed Coatings Utilizing Micro-Scale Nickel Encapsulated, Hexagonal-Boron-Nitride," *Tribology Transactions*, 55, pp. 624-630, 2012.

60. A.E. Segall, C. Drapaca, D. Engels*, T. Zhu*, and H. Yang*, "Direct and Inverse Solutions for Thermal- and Stress-Transients and the Analytical Determination of Boundary Conditions Using Remote Temperature or Strain Data," *ASME Journal of Pressure Vessel technology*, 134, pp. 041011-1-041011-9, 2012.

61. A.E. Segall, C. Drapaca, and D. Engels*, "Inverse Determination of Thermal Boundary Conditions from Transient Surface Temperatures and Strains in Slabs and Tubes," Journal of Materials, and Manufacturing Processes, 27, pp. 860-868, 2012.

62. P.J Blau, K.M. Cooley, D. Bansai, I. Smid, T.J. Eden, M. Neshastehriz*, J.K. Potter, and A.E. Segall, "Spectrum Loading Effects on the Running-in of Lubricated Bronze and Surface Treated Titanium against Alloy Steel," *Wear*, 302, pp. 1064-1072, 2013.

63. J. Harris*, A.E. Segall, D. Robinson, and R. Carter, "Interfacial Flaw Evolution of Coatings Under Severe Thermal and Pressure Transients," ASME Journal of Pressure Vessel technology, 136 [6], December, 2014.

64. A.E. Segall, D. Engels*, C. Drapaca, and J. Harris*, "An Inverse Method for Determining Temperature Dependent Thermophysical Properties based on a Remotely Measured Temperature History," Inverse Problems in Engineering and Science, 22 [4], pp. 672-681, 2014.

65. M. Neshastehriz*, I. Smid, and A.E. Segall, "In-Situ Agglomeration, and De-Agglomeration by Milling of Nano-Engineered Lubricant Particulate Composites for Cold-Spray Deposition," ASM Journal of Thermal Spray Technology, 23 [7], pp. 1191-1198, 2014.

66. J.T. Harris*, A.E. Segall, D. Robinson*, and R. Carter, "Cohesive Zone Property Measurement by a Hybrid Experimental and Numerical Method using Ball Indentations," ASTM Journal of Testing and Evaluation, 43 [4], pp.1-11, 2015.

67. A. Segall, "Closed-Form Inverse Determination of Force Excitations for Undamped and Damped Linear-Systems using a Least-Squares Approach," Published in the Universal Journal of Mechanical Engineering, 4 [2], pp. 50-55, 2016, DOI: 10.13189.

68. M. Neshastehriz*, I. Smid, and A.E. Segall, "On the Bonding Mechanism in Cold Spray of Deformable hex-BN-Ni Clusters," Published in the ASM Journal of Thermal Spray Technology, 25 [5], pp. 982-991, 2016, DOI 10.1007/s11666-016-0416-6, ISSN 1059-9630.

69. F.A. Sohag*, F.R. Beck*, L. Mohanta*, F.B. Cheung, A.E. Segall, T.J. Eden, and J. Potter, "Enhancement of Downward Facing Boiling Heat Transfer by the Cold Spray Technique" Published in the Nuclear Engineering and Technology, 49, pp.113-122, 2017 http://www.sciencedirect.com/science/article/pii/S1738573316301383.

70. F.A. Sohag*, F.R. Beck*, L. Mohanta*, F.B. Cheung, A.E. Segall, T.J. Eden, and J. Potter, "Effects of Subcooling on Downward Facing Boiling Heat Transfer with Micro-Porous Coating Formed by Cold Spray Technique," Published in the International Journal of Heat and Mass Transfer, 106, pp. 767-780, 2017. http://www.sciencedirect.com/science/article/pii/S0017931016303714.

71. A. Kamat*, A.E. Segall, S.M. Copley, and J.A. Todd, "Enhancement of CP-Titanum Wear Resistance Using a Two-Step CO2 Laser-Sustained Plasma Nitriding Process," Surface & Coatings Technology, 325, pp. 229-238, 2017. http://authors.elsevier.com/sd/article/S0257897217306333

72. A.E. Segall, F.A. Sohag*, F.R. Beck*, L. Mohanta*, F.B. Cheung, T.J. Eden, and J. Potter, "Micro-Porous Coatings and Enhanced CHF for Downward Facing Boiling During Passive Emergency Reactor Cooling" ASME Journal of Pressure Vessel Technology, 139 [5], pp. 051601-1-051601-9, 2017.

73. A.M. Kamat*, S.M. Copley, A.E. Segall, J.A. Todd, "Laser-Sustained Plasma (LSP) Nitriding of Titanium: a Review," Coatings: Special Issue on Laser Surface Engineering, 283 [9], pp. 1-22, ISSN 2079-6412, 2019.

74. M. Neshastehriz*, A.E. Segall, I. Smid, and T.J. Eden, "Influence of Hardenability of Nickel Encapsulated, Hexagonal-Boron-Nitride Particles on the Enhanced Formation of Cold-Spray Coatings," Submitted to the Journal of Thermal Spray Technology, 2018.

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26. A.E. Segall*, "Thermal Shock and Fatigue Behavior of Ceramics and the Evolution of Proactive Design and Analysis Methodologies," **INVITED PRESENTATION** to the University of Florida, Gainesville, FL, April 22 1996.

27. A.E. Segall*, J.A. Kostic, J.C. Conway, Jr., M. Amateau, and S. Opet, "The Sliding Wear Behavior of Cobalt-Based Hardfacing Alloys Used in Steam Valve Applications," Presented at the 1996 ASME/STLE International Tribology Conference and Exposition, San Francisco, CA, October 13-17, 1996.

28. J.J. Tu* and A.E. Segall, "Thermomechanical Analysis of a Complex, Refractory Tundish Flow Modifier During Preheating," Presented at the Unified International technical Conference on Refractories, 5th Biennial Worldwide Congress, New Orleans, LA, November 1997.

29. T.E. Haberberger*, M.C. Baran, B.A. Shaw*, A.E. Segall, H.M., and Kopech, "P/M Ferritic Stainless Steels for Exhaust System Components," Presented at the 1997, SAE International Congress and Exposition, Detroit, MI, February 24-27, 1997.

30. W.D. Martin*, J. Tu, and A.E. Segall, "Acoustic Emission (AE) Characterization of Refractories During a High Temperature Firing Cycle," Presented at the Eighth International Symposium on Nondestructive Characterization of Materials, Boulder Colorado, June 15-20, 1997.

31. M.C. Baran*, A.E. Segall, B.A. Shaw, H.M. Kopech, and T.E. Haberberger, "Evaluation of P/M Ferritic Stainless Steels for Automotive Exhaust Applications," Presented at the 1997, International Congress on Powder Metallurgy & Particulate Materials, Chicago, IL, June 29-July 2, 1997.

32. P.H. Cohen*, A.E. Segall, M.A. Amateau, and J.C. Conway, Jr., "Machining Performance of Ceramic Cutting Tools," Presented to Greenleaf Corporation, Saegertown, PA, June 1997.

33. A.E. Segall*, "Development of a Commercialization Plan for the Industrial Application of the Cold Gas Spray Method," Presented at the Industrial Commercialization Workshop sponsored by DOE and Battelle Laboratories, Denver, CO, September 1997.

34. N.J. Salamon*, F. Costanzo, R.S. Engel, A.E. Segall, and G.L. Gray, "Mechanics Reform in Introductory Strength of Materials: Accomplishments to Date," Presented at the ECSEL Workshop, Howard University, Washington D.C., October 24-25, 1997.

35. A.E. Segall* and M.F. Amateau, "Development of a laminated Ceramic Composite Manufacturing Method for Light-Weight Armor," Poster presentation at the Defense Manufacturing Conference '97, Palm Springs, CA, December 1-4, 1997.

36. A.E. Segall* A. Papyrin, J.C. Conway, Jr., and M.F. Amateau, "Development of a Cold Gas Spray Manufacturing Method for Component Wear Reduction," Poster presentation at the Defense Manufacturing Conference '97, Palm Springs, CA, December 1-4, 1997.

37. A.E. Segall* A. Papyrin, J.C. Conway, Jr., and D. Shapiro, "Utilization of a Cold Gas Spray Coating Process for the Enhancement of Titanium," Presented at the 127th TMS Annual Meeting, San Antonio, TX, February 15-19, 1998.

38. T.E. Haberberger*, A.E. Segall, B.A. Shaw, and T. Cimino, "Characterization of Creep, Strength, and Corrosion Properties of Ferritic and Austenitic P/M Stainless for Exhaust Applications," Presented at the 1998, SAE International Congress and Exposition, Detroit, Michigan, February 23-26, 1998.

39. A.E. Segall*, J.C. Conway, Jr., D.H. Stiver III, C.A. Moose, S. Hershman, and S. Opet, "Elevated temperature Fretting Evaluation using a Flat-on-Flat Configuration," Presented at the STLE '98, Detroit, Michigan, May 17-21, 1998.

40. A.E. Segall*, B.A. Shaw*, M.C. Baran, M.M. McCosby, T. Cimino, and T.E. Haberberger, "Elevated Temperature Design Properties of P/M Stainless Steels," Presented at the 1998, International Congress on Powder Metallurgy & Particulate Materials, Las Vegas, NV, May 31-June 4, 1998.

41. A.E. Segall* and J.C. Conway Jr., "Problem Solving Through Multi-Discipline Interdepartmental Tribology Interaction at Penn State," Presented at the 72nd American Chemical Society Colloid and Surface Science Symposium, University Park, PA, June 22-June 24, 1998.

42. S. Chakravarty*, J.P.Dyer, J.C. Conway Jr., A.E. Segall, and P.C. Patniak, "Influence of Surface Treatments on Fretting Fatigue of Titanium Alloys at Elevated Temperatures," Presented at the 2nd International Symposium on Fretting Fatigue, Salt Lake City, Utah, August 30-September 3, 1998.

43. J. Galbraith*, A.E. Segall,. A.N. Papyrin, J.C. Conway, Jr., D. Shapiro, M.F. Amateau, and T. Eden, "Utilization of the Cold Gas Spray Coating Process for the Improvement of Sliding and Abrasive Wear Performance," Presented at the Thermal Spray Symposia at the ASM Materials Solutions Conference and Exposition, Chicago, Ill, October 12-15, 1998.

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46. A.J. Freimanis*, A.E. Segall, J.C. Conway, Jr., and E.J. Whitney, "Elevated Temperature Evaluation of Fretting and Metal Transfer between Coated Titanium Components," Presented at the STLE '99, Las Vegas, Nevada, May 24-27, 1999.

47. A.E. Segall*, B.A. Shaw, T. Cimino, and T.E. Haberberger, "Studies on the Creep and Corrosion Behaviors of Various P/M Stainless Steel Alloys," Presented at the 1999, International Conference on Powder Metallurgy & Particulate Materials, Vancouver, British Columbia, June 20-24, 1999.

48. A.E. Segall*, A.J. Freimanis, J.C. Conway, Jr., and E.J. Whitney, "The Influence of Temperature and Wear Mode on the Deterioration of Coatings used for Titanium Aircraft Engine Components," Presented at the STLE 2000, Nashville, TN, May 7-11, 2000.

49. T. Cimino*, A.E. Segall*, T. Murphy, T.E. Haberberger, and B.A. Shaw, "The Effects of Microstructure and Pore Morphology on Mechanical and Dynamic Properties of Ferrous P/M Materials," Presented at the 2000 International Congress on Powder Metallurgy & Particulate Materials, New York, NY, May 30-June 3, 2000.

50. A.E. Segall* "Approximate Relationships for Thermal Stresses in Thick-Walled Vessels Under an Arbitrary Thermal Shock," Presented at the ASME Pressure Vessel and Piping Conference: PVP-Vol. 399 Design and Analysis of Pressure Vessels and Piping, Seattle, WA, July 23-27, 2000.

51. A.E. Segall* "Development and Usage of Proactive Design Methodologies for Brittle Materials, **INVITED PRESENTATION** at Boeing Company Phantom Works, Seattle, WA, November 2000.

52. A.E. Segall* "Fretting and Damage Mechanisms between Titanium Aircraft Components," **INVITED PRESENTATION** at Portland State University, April 2001.

53. A.E. Segall*, T. Murphy, T. Cimino, T.E. Haberberger, and B.A. Shaw, "The Influence of Microstructure and Carbide Particles on the Creep Behavior of P/M Alloys," Presented at the International Congress on Powder Metallurgy & Particulate Materials, New Orleans, La, May 13-17, 2001.

54. C. Hager*, A.E. Segall, J.C. Conway, Jr., H. Dang, and M. Amateau, "Tribotesting Methodologies for Evaluating the Wear Behavior of Hypereuthectic AL-Si Alloys," Presented at the STLE 2001, Orlando, FL, May 21-24, 2001.

55. A.E. Segall*, "Fretting and Damage Mechanisms between Titanium Aircraft Components and the Destruction of Lubricious Coatings," **INVITED PRESENTATION** at the DOE Albany Research Center, Albany, Oregon, November 9, 2001.

56. C. Hager*, J.C. Conway, Jr., and A.E. Segall, "FA-18, F404 Engine Fretting and Low Cycle Fatigue Amelioration," Presented at the Defense Manufacturing Conference 2001, Las Vegas, Nevada, November 26-29, 2001.

57. A.E. Segall* D. Young, and D. Hutton, "Development of a Split-Beam Method for Improved Laser Machining of Ceramics," Poster presentation at the 2002 NSF Design, Service, and Manufacturing Grantees and Research Conference, San Juan, Puerto Rico, January 7-10, 2002.

58. A.E. Segall*, T. Mclaren, J. Swearengen, H. Gürocak, and P. Ferro, "Development of an Interdisciplinary Manufacturing Engineering Program based on a Project and Society Oriented Approach," Presented at the CIRP International Manufacturing Education Conference, Enschede, The Netherlands, April 3-5, 2002.

59. A.C. Day*, M. Strasik, J. Mittleider, J. Edwards, P.E. Johnson, M.D. Higgins, J.R. Schindler, K.E. McCrary, R.A. Hawkins, D.L. Carlson, and A.E. Segall, "Flywheels with All-Passive, Non-Contact Magnetic Suspensions," Presented at the Electric Energy Storage & Applications Technology Conference, San Francisco, CA, April 15-17, 2002.

60. A.E. Segall* "'How to Use O-ring and C-ring Tests to Evaluate the Uniaxial Strengths of Ceramic Tubes" **INVITED PRESENTATION** for the Workshop on How to Characterize, Test and Design with Ceramics at the 2002 Annual Meeting of the American Ceramic Society, St. Louis, Missouri, April 29-May 1, 2002.

61. A.E. Segall*, M.J. Sipics, and J.C. Conway Jr., "Evaluation of the Uniaxiality of the Stress State in O-Ring Fracture Strength Specimens" Presented at the 2002 Annual Meeting of the American Ceramic Society, St. Louis, Missouri, April 29-May 1, 2002.

62. A.E. Segall*, C. Hager, J.C. Conway, Jr., H. Dang, and M. Amateau, "Testing Methodologies for Evaluating the Fretting Resistance of Plasma-Sprayed and High-Velocity-Particle-Consolidated Cobalt and Nickel Coatings," Presented at the STLE 2002, Houston, TX, May 21-24, 2002.

63. A.E. Segall* "Thermal Shock and Fatigue Behaviors of Ceramics in Tubular Form with Thoughts on Complex Thermomechanical Loading and Wear," **INVITED PRESENTATION** at the U.S. Army Research Laboratory, Aberdeen Proving Ground, MD, June 5, 2002.

64. A.E. Segall* "Science Fiction in Engineering Instruction: To Boldly Go Where No Educator Has Gone Before," Presented at the 2002 ASEE Annual Conference, Montreal, Canada, June 16-19, 2002.

65. A.E. Segall*, J.C. Conway, Jr., and C. Hager, Jr., "Temperature Dependant Degradation Mechanisms in Cu-Ni-In Anti-Fretting Coatings and the Complicated Search for Alternatives," Presented at the 39th Annual Technical Meeting of the Society of Engineering Science, University Park, PA, October 14-16, 2002.

66. A.E. Segall*, C. Hager, Jr., J.C. Conway, Jr., and M.F. Amateau, "The Influence of Manufacturing Processes on the Reciprocating Wear Behavior of Hypereutectic B390 Alloys," Presented at the 39th Annual Technical Meeting of the Society of Engineering Science, University Park, PA, October 14-16, 2002.

67. A.E. Segall*, "Thoughts on the Use of Science Fiction in Engineering Instruction to Teach Basic Concepts and to Create Positive Images of the Profession," presented at the 39th Annual Technical Meeting of the Society of Engineering Science, University Park, PA, October 14-16, 2002.

68. A.E. Segall* D. Young, A. Ravindra, with B. Li, "CAREER: Development of a Split-Beam Method for Improved Laser Machining of Ceramics," Poster presentation at the 2003 NSF Design, Service, and Manufacturing Grantees and Research Conference, Birmingham, AL, January 6-9, 2003.

69. A.E. Segall*, G. Cai, A. Ravindra, with B. Li, "Reduced Fracture Damage in Ceramics during Laser Machining: Dual-Beam Innovations and Modeling," Poster presentation at the 2003 MRI Materials Day, The Pennsylvania State University, University Park, PA, April 15th, 2003.

70. A.E. Segall*, J.C. Conway, and C. Hager, "Evaluation of the Effects of Lubricants on the Elevated Fretting behaviors of Cobalt and Nickel Coatings," Presented at the STLE 2003, New York, NY, April 28-May 1, 2003.

71. A.E. Segall* and T. Embree, "Evaluation of the Uniaxiality of the Stress State in C-Ring Fracture Strength Specimens" Presented at the 2003 Annual Meeting of the American Ceramic Society, Nashville, TN, April 28-May 1, 2003.

72. A.E. Segall*, G. Cai, R. Ravindra, and B. Li, "Development and Modeling of Simultaneous Dual-Beam Laser Machining Methods to Eliminate Fracture Damage in Alumina Ceramics" Presented at the 2003 Annual Meeting of the American Ceramic Society, Nashville, TN, April 28-May 1, 2003.

73. A.E. Segall*, J. McConnell, and T. Eden, "Sliding Wear Behavior of Transformed Alumina and Hypereutectic Al-Si Alloys Under Simulated Wire-Rope Interactions," Presented at the 40th Annual Technical Meeting of the Society of Engineering Science, University of Michigan, Ann Arbor, MI, October 12-15, 2003.

74. D. Blankenship, J. Rawers, A. Romasco, and A.E. Segall*, "2-D versus 3-D Abrasive Scratch Wear Analysis," Presented at the 40th Annual Technical Meeting of the Society of Engineering Science, University of Michigan, Ann Arbor, MI, October 12-15, 2003.

75. A.E. Segall, "Controlled Fracture and Damage Mitigation during CO_2 Laser Machining of Alumina Ceramics via a New Dual-Beam Approach," **INVITED PRESENTATION** at Rutgers University, Piscataway, NJ, October 21, 2003.

76. A.E. Segall*, G. Cai, A. Romasco, A. Ravindra, with B. Li, "CAREER: Development of a Split-Beam Method for Improved Laser Machining of Ceramics," Poster presentation at the 2004 NSF Design, Service, and Manufacturing Grantees and Research Conference, Dallas, TX, January 5-8, 2004.

77. A.E. Segall*, J.H. Underwood, M.E. Todaro, and G.N. Vigilante, "Probabilistic Fracture Assessment of the Pulsed Laser Heating Test for Assessing the Thermal Shock and Fatigue Behaviors of Ceramics," **INVITED PRESENTATION** at the 28th International Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites, Cocoa Beach, Florida, January 25-30, 2004.

78. O.M. Jadaan*, A.E. Segall, and N. Nemeth, "Transient Reliability of Thermally Shocked SiC Tubes," Presented at the 28th International Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites, Cocoa Beach, Florida, January 25-30, 2004.

79. A.E. Segall*, G. Cai, R. Arakrapu, S. Pullford, and P. Brugan, "Fracture Control and Damage Mitigation Laser Machined Ceramics using Dual CO_2 Beams," Presented as an Engineering Science and Mechanics Seminar, The Pennsylvania State University, University Park, PA, April 21, 2004.

80. A.E. Segall*, J. McConnell, and T. Eden, "A New Tribotesting Methodology for Simulating Sliding Wear Conditions of Wire-Rope on various Aluminum Alloys," Presented at the STLE 2004, Toronto, Canada, May 17-19, 2004.

81. A.E. Segall, R. Akarapu*, G. Cai, S. Pullford, and P. Brugan, "Quantification of Thermophysical and Evolving Strength Properties of Alumina Ceramics during Dual-Beam Laser Machining," Presented at the SURA/ORNL Kickoff Meeting, Oak Ridge, Tennessee, June 5th, 2004.

82. V.M. Pereles-Santiago*, M. Washington*, and A.E. Segall,"Faster and Damage Free Laser Machining of Thicker Alumina using the Simultaneous Prescore Approach in Pulsed Mode," Poster presentation at the 2004 CIC SROP Conference, University of Iowa, June 10th, 2004.

83. A.E. Segall, R. Akarapu*, G. Cai S. Pullford, and P. Brugan, "Results for the Quantification of Thermophysical and Evolving Strength Properties of Alumina Ceramics during Dual-Beam Laser Machining," Presented at the SURA/ORNL Closing Meeting, Oak Ridge, Tennessee, September 11th, 2004.

84. A.E. Segall*, G. Cai, R. Akarapu, S. Pullford, and P. Brugan "Preordained Fracture Paths and Tailored Thermoelastic Stress- States to Control/Repair Damage during Dual-Beam Laser Machining of Ceramics," Presented at the 41st Annual Technical Meeting of the Society of Engineering Science, University of Nebraska, Lincoln, NB, October 11-14, 2004.

85. A.E. Segall*, "Thermoelastic Stresses from the Inverse Solution: A Direct Approach," Presented at the 41st Annual Technical Meeting of the Society of Engineering Science, University of Nebraska, Lincoln, NB, October 11-14, 2004.

86. A.E. Segall* and C. Hager, "A Comparison of HVPC and Plasma-Spray Coatings for the Amelioration of Two-Stage Fretting of Ti Alloys," Presented at the 41st Annual Technical Meeting of the Society of Engineering Science, University of Nebraska, Lincoln, NB, October 11-14, 2004.

87. R. Akarapu* and A.E. Segall, "Investigation of an Active Stressing Technique for Delaying Fracture during Laser Cutting of Alumina," Presented at the ASME IMECE2004-61243 International Mechanical Engineering Congress & Exposition, Anaheim, California, November 13-9, 2004.

88. A.E. Segall*, G. Cai, R. Akarapu, S. Pullford, P. Brugan, V. Pereles-Santiago, and M. Washington, "Evolving Damage and Fracture Control Strategies for Improving the Quality of Laser Machined Ceramics," Presented at the 29th International Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites, Cocoa Beach, Florida, January 24-27, 2005.

89. A.E. Segall*, G. Cai, R. Akarapu, S. Pullford, and P. Brugan "Surface Modification and Fracture Control Methodologies for Ceramics using Simultaneous CO_2 Lasers," Poster presentation at the 2005 MRI Materials Day, The Pennsylvania State University, University Park, PA, April 13-15, 2005.

90. A.E. Segall*, I. Smid, T.J. Eden, P. Walia, and G. Aggrawal "Self-Lubricating Coatings Manufactured by High Velocity Particle Consolidation," Poster presentation at the 2005 MRI Materials Day, The Pennsylvania State University, University Park, PA, April 13-15, 2005.

91. A.E. Segall*, C. Knepper, T. Volinoto, and T.J. Eden, "Tribological Evaluation of Cryogenically Treated and Al2O3 Transformed Aluminum under Simulated Wire-Rope Interactions," Presented at the STLE 2005, Las Vegas, Nevada, May 16-19, 2005.

92. A.E. Segall*, C. Knepper, T. Volinoto, and T.J. Eden, "Tribological Evaluation of Cryogenically Treated and Al2O3 Transformed Aluminum under Simulated Wire-Rope Interactions," Presented at the STLE 2005, Las Vegas, Nevada, May 16-19, 2005.

93. V.M. Pereles-Santiago* (University of Puerto Rico), AM. Dugue* (University of New Orleans), and A.E. Segall, "Laser Welding and Healing of Alumina Using the Dual-Beam Approach in Pulsed Mode," Poster presentation at the 2005 CIC SROP Conference, University of Wisconsin at Madison, July 14th, 2005.

94. A.E. Segall* "Thermoelastic Stresses in Thick-Walled Vessels under an Arbitrary Thermal Transient via the Inverse Route," Presented at the 2005 ASME Pressure Vessel and Piping Conference, Denver, Colorado, July 17-21, 2005.

95. V.M. Pereles-Santiago (University of Puerto Rico), AM. Dugue (University of New Orleans), and A.E. Segall, "CO_2 Laser Healing of Alumina Ceramics," Presented at the 2005 SROP Research Symposium, The Pennsylvania State University, July 26th, 2005.

96. A.E. Segall*, G. Cai, R. Arakrapu, S. Pullford, P. Brugan, V. Pereles-Santiago, and M. Washington, "Dual $C0_2$ Beam Processing for the Control and Healing of Micro- to Macro-Scale Damage in Ceramics," **INVITED PRESENTATION** at the 6th International, Pacific Rim Conference on Ceramics and Glass Technology, Maui, Hawaii, September 11-17, 2005.

97. A.E. Segall*, I. Smid, T.J. Eden, G. Aggarwal and P. Walia, " High-Velocity-Particle-Consolidation (HVPC) and the Development Ni/Boron-Nitride Self-Lubricating Coatings," **INVITED PRESENTATION** at the CISP Industrial Members Meeting, University Park, PA October 18-19, 2005.

98. A.E. Segall*, G. Cai, R. Arakrapu, S. Pullford, P. Brugan, V. Pereles-Santiago, and M. Washington, "Control and Amelioration of Micro- to Macro-Scale Damage in Ceramics using Lasers," **INVITED PRESENTATION** at the National Institute for Standards and Technology (NIST), October 24th, 2005.

99. T.J. Eden* and A.E. Segall, "F/A-18 F404 Fretting and Low Cycle Fatigue (LCF) Amelioration," Presented at the Defense Manufacturers Conference (DMC), Orlando, Florida, November 28 - December 1, 2005.

100. S.E. Schoenberg, A. Grader, P. Halleck, A.E. Segall, G. L. Messing, and D. J. Green*, "Determination of Densification Stresses and Distortions Resulting from Green Density Gradients," Presented at the 30th International Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites, Cocoa Beach, Florida, January 22-27, 2006.

101. A.E. Segall*, R. Arakrapu, G. Cai,, S. Pullford, P. Brugan, J. Harris, D. Mangels, V. Pereles-Santiago, A. Dugue, and M. Sikora, "The Emerging Role of Dual-Beam Lasing for Shaping Ceramics: Advances in Welding/Joining and the Amelioration of Damage at all scales," **INVITED PRESENTATION** at the 30th International Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites, Cocoa Beach, Florida, January 22-27, 2006.

102. I. Smid*, G. Aggarwal, and A.E. Segall, "Modeling of Deformation and Bonding of Composite Particle during Cold-Spray Deposition," Presented at the TMS Annual Meeting & Exhibition, San Antonio, Texas, March 12-16, 2006.

103. A.E. Segall*, and C.D. Knepper, "A Study on The Sliding Wear of Cryogenically Treated Aluminum Alloys and the Inverse Determination of Interfacial Temperatures," **INVITED PRESENTATION** to the Dayton STLE Chapter, March 31, 2006.

104. P. Walia*, G. Aggarwal, A.E. Segall, I. Smid, T. Eden, and J. Potter, "High-Velocity Particle-Consolidation (HVPC) for Nickel Based Self-Lubricating Composite Coatings on TI-6AL-4V," Presented at the College of Engineering Research Symposium, March 17 - 18, 2006, University Park, PA**.**

105. A.E. Segall*, I. Smid, T.J. Eden, P. Walia, and G. Aggrawal "Wear Resistant Self-Lubricating Coatings Manufactured by the High Velocity Particle Consolidated (HVPC) Process," Poster presentation at the 2006 MRI Materials Day, The Pennsylvania State University, University Park, PA, April 13-15, 2006.

106. A.E. Segall* and R. Akarapu, "Control and Amelioration of Micro- to Macro-Scale Damage in Ceramics using Simultaneous CO_2 Lasers," Poster presentation at the 2006 MRI Materials Day, The Pennsylvania State University, University Park, PA, April 13-15, 2006.

107. P. Walia*, G. Aggrawal, A.E. Segall, I. Smid, T.J. Eden, and, J.K. Potter "Fabrication of Ni-MoS_2 and Ni-BN Coatings using the High Velocity Particle Consolidated (HVPC) Process," Presentation at the 2006 CISP IMM Meeting, The Pennsylvania State University, University Park, PA, April 25-26, 2006.

108. A.E. Segall*, and C.D. Knepper, "A New methodology for the Inverse Determination of Interfacial Temperatures using a Single Subsurface Measurement," Presented at the STLE 2006*,* Calgary, Canada, May 7-11, 2006.

109. G. Aggarwal*, P. Walia, A.E. Segall, I. Smid, and T. Eden, "Development of Self-Lubricating Coatings for Ti-6Al-4V Dovetails using a High-Velocity Particle-Consolidation (HVPC) Process," Proceedings of the International Thermal Spray Conference 2006, May 15-18, Seattle, WA.

110. A.E. Segall "Thermal Shock and Fatigue Methodologies for Tubular Components: Experimental and Iterative Finite-Element Methods," **INVITED PRESENTATION** to the Korea Institute of Nuclear Safety, June 7, 2006.

111. A.E. Segall "Generalized Analytical and Approximate Methods for the Solution of Direct and Inverse Thermal, Stress, Fracture, and Vibration Problems," **INVITED PRESENTATION** to the Korea Institute of Nuclear Safety, June 8, 2006.

112. A.E. Segall "Thermal Shock and Fatigue and the often Overlooked Influence of Stress-Curvature Relationships," **INVITED PRESENTATION** to the European Commission, Directorate-General, Joint Research Centre (JRC), Institute for Energy-Nuclear Safety Unit, Petten, The Netherlands, June 20, 2006 (postponed).

113. A.E. Segall*, P. Walia, G. Aggarwal, I. Smid, and T. Eden "Solid-State Deposition Methods and the Development of Self-Lubricating Coatings and Alloys," **INVITED PRESENTATION** to the Slovak University of Technology, Bratislava, Slovakia, June 21, 2006.

114. A.E. Segall* and R. Carter, "Finite-Element Modeling of the Thermal/Structural Response of a Rifled Silicon-Nitride Barrel Subjected to Thermal and Pressure Transients," Presented at the 2006 international ASME Pressure Vessel and Piping Conference, July 23-27, Vancouver, BC.

115. A.E. Segall*, I. Smid, T. Eden, P. Walia, and G. Aggarwal, "Development and Evaluation of the Wear Behaviors of Self-Lubricating Coating Systems Manufactured by High Velocity Particle Consolidated (HVPC)," Presented at the 43rd Annual Technical Meeting of the Society of Engineering Science, University Park, PA, August 13-16, 2006.

116. A.E. Segall*, G. Aggarwal, P. Walia, I. Smid, and T. Eden, "Self-Lubricating Coatings for Ti-6AL-4V Dovetail Applications from HVPC," Poster presentation at Coating Materials and Technology for Extreme Environments, September 12-13, University Park, PA, 2006.

117. A.E. Segall*, G. Aggarwal, P. Walia, I. Smid, and T. Eden, "Development and Validation of HVPC Self-Lubricating Coatings," **INVITED PRESENTATION** at Coating Materials and Technology for Extreme Environments, September 12-13, University Park, PA., 2006

118. J.R Hellmann, A.E. Segall, R. Koseski*, B. Scheetz, W. Luscher, A. Shindyapin, "Finite Element Analysis and Experimental Verification of Failure in Packed Particle Beds Comprised of Spherical Ceramic Particles," Presented at the Materials Science & Technology 2006, October 10-19, Cincinnati, OH, 2006.

119. J.R Hellmann, R. Koseski*, B. Scheetz, and A.E. Segall, "High Strength, High Reliability Glass Spheres via Flame Spheroidization of Mixed Glass Cullet," Presented at the Materials Science & Technology 2006, October 10-19, Cincinnati, OH, 2006.

120. A.E. Segall*, "Understanding and Mitigation of Thermal Shock and Fatigue Threats for High-Temperature Ceramic Furniture," **INVITED PRESENTATION and Discussions** at Rolls Royce Ltd. in conjunction with BTU International, November 2, Loughborough, United Kingdom, 2006.

121. A.E. Segall*, "Thermomechanical Analysis of Alumina Saggers for Manifold Sintering," **INVITED PRESENTATION** at BTU International, October 27, Billerica, MA, 2006.

122. A.E. Segall*, "Comprehensive Design and Characterization Methodologies for Advanced Materials with Thoughts on the Application to IGCC Systems," **INVITED PRESENTATION** to DOE/NETL, Pittsburgh, PA, December 6, 2006.

123. R. Koseski*, J.R Hellmann, B. Scheetz, A.E Segall, J. Harris, “Innovative Processing of Silaceous Minerals for High Strength Glass-Ceramic Materials Applications,” presented at the 31st International Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites, Daytona Beach, Florida, January 21-26, 2007.

124. G. Aggarwal, I. Smid*, and A.E. Segall,” Impact-Contact Modeling of Particle Bonding in the Cold Gas Dynamic Spray Process,” Presented at the TMS Annual Meeting & Exhibition, February 25-29, Orlando, FL, 2007.

125. G. Agrawal*, I. Smid, A.E. Segall, "Impact-Contact Modeling of Particle Bonding in the Cold Gas Dynamic Spray Process" presented at the CISP Industry Members Meeting, University Park, PA, April 9th, 2007.

126. A.E. Segall* I. Smid, T. J. Eden, “Self-Lubricating Coating Systems via High-Velocity Particle Consolidation,” Poster presentation at the 2006 MRI Materials Day, The Pennsylvania State University, University Park, PA, April 10-11, 2007.

127. A.E. Segall* and R. Akarapu, “Micro-Manipulation of Complex Stress-States During Laser Machining to Improve Manufacturing,” Poster presentation at the 2006 MRI Materials Day, The Pennsylvania State University, University Park, PA, April 10-11, 2007.

128. W.G. Luscher*, R.P. Koseski, J.M. Boyce, K.C. Hoff, M.D. Wallace, J.T. Harris, Y.Jin, J.R. Hellmann, B.E. Scheetz, D.J. Green, T.J. Eden, E. Ryba, and A.E. Segall, “Engineered Ceramics for Energy, Industrial, and Defense/Homeland Security,” Poster presentation at the 2007 MRI Materials Day, The Pennsylvania State University, University Park, PA, April 10-11, 2007.

129. J. Weyant*, A. Segall and I. Smid, "Metal Coating Hexagonal Boron Nitride for Cold Spray Applications,” presented at the CISP Industry Members Meeting, University Park, PA, April 9th, 2007.

130. A.E. Segall* and C.D. Knepper, “Sliding Wear Behaviors of Cryogenically Treated Alloys and the Estimation of Interfacial Temperatures using a New and Analytical Inverse Approach,” **INVITED PRESENTATION as a DISTINGUISHED VISITING PROFESSOR** at the American University in Cairo (AUC), Cairo, Egypt, April 16th, 2007.

131. A.E. Segall*, I. Smid, T.J. Eden, P. Walia, and G. Aggrawal “Ti and Boron-Nitride Self-Lubricating Coating Systems Manufactured by High Velocity Particle Consolidation,” **INVITED PRESENTATION as a DISTINGUISHED VISITING PROFESSOR** at the American University in Cairo (AUC), Cairo, Egypt, April 16th, 2007.

132. A.E. Segall*, “Science Fiction and New Opportunities for Engineering Instruction,” **INVITED PRESENTATION as a DISTINGUISHED VISITING PROFESSOR** at the American University in Cairo (AUC), Cairo, Egypt, April 16th, 2007.

133. A.E. Segall*, R. Akarapu, G. Cai, S. Pullford, P. Brugan, J. Harris, D. Mangels, V. Pereles-Santiago, A. Dugue, and M. Sikora “Dual- Lasers and the Micro-Manipulation of Transient Stress-States: Explorations from Welding/Joining to the Amelioration of Damage at Multiple Scales,” **INVITED PRESENTATION as a DISTINGUISHED VISITING PROFESSOR** at Cairo University, Cairo, Egypt, April 17th, 2007.

134. A.E. Segall*, T.J. Eden, A. Wengert, and J. Potter, “High Velocity Particle Consolidation (HVPC) for the Evaluation of Erosive Wear,” Presented at the International STLE 2007, Philadelphia, PA, May 7-10, 2007.

135. A.E. Segall*****, R. Akarapu, G. Cai, S. Pullford, and P. Brugan, "New Way of Laser Machining Ceramics: The Micro-Manipulation of Stress-States and Fracture-Paths using Dual Beams," **INVITED PRESENTATION** at the 10th International European Ceramic Society (ECerS) Congress, Berlin, Germany, June 17-21, 2007.

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136. A.E. Segall***** and R. Carter, "Finite-Element Simulations and Probabilistic Fracture Assessments of the Response of Alternate Rifling Geometries," Presented at the 2007 International ASME Pressure Vessel and Piping Conference, July 22-27, San Antonio, TX, 2007.

137. A.E. Segall***** and J.R. Hellmann, "Comprehensive Design Methodologies for Advanced Materials in High Temperature Applications," **INVITED PRESENTATION** at Pratt & Whitney, East Hartford, Connecticut, Postponed until Fall, 2007.

138. A.E. Segall*****, I. Smid, T.J. Eden, P. Walia, and G. Aggrawal, Development and Modeling of Self-Lubricating Coating Systems via High Velocity Particle Consolidation and the Role of Elastic-Plastic Stress-States on Adhesion," **INVITED PRESENTATION** at McMaster University, Hamilton, Ontario, Canada, August 13, 2007.

139. A.E. Segall***** and J. Meeker, "Boundary-Conditions, Temperatures, and Stress-Intensity Factors under Arbitrary Thermal Transients via the Inverse Route," **INVITED PRESENTATION** at The 19th **International Conference** on Structural Mechanics in Reactor Technology, August 12-17, Toronto, Canada, 2007.

140. A.E. Segall*****, D.J. Green, R.E. Tressler, D.L. Shellmann, and J.R. Hellmann, "Properties/Performance Evaluation of Thermostructural Materials and Coatings," **INVITED PRESENTATION** at Atomic Energy of Canada, Limited, Toronto, Canada, August 17th, 2007.

141. A.E. Segall***** and J.R. Hellmann, "Comprehensive Design and Analysis Methodologies for Advanced Materials in High Temperature and Pressure Applications," **INVITED PRESENTATION** at Atomic Energy of Canada, Limited, Toronto, Canada, August 17th, 2007.

142. A.E. Segall*****, "Science Fiction in Engineering Instruction: The Final Frontier," **INVITED PRESENTATION** at the **International Conference** on Engineering Education, September 3-7, Coimbra, Portugal, 2007.

143. A. E. Segall***** and J. R. Hellmann, "Comprehensive Design Methodologies for Advanced Materials in High Temperature Applications," **INVITED PRESENTATION** to Pratt and Whitney representatives, University Park, PA, October 12, 2007.

144. A. E. Segall***,** "Science Fiction and New Opportunities for Engineering Instruction," **INVITED PRESENTATION** at Element Six, Johannesburg, South Africa, November 7th, 2007.

145. A. E. Segall***),** I. Smid, T. J. Eden, P. Walia, and G. Aggrawal, "Ti and Boron-Nitride Self Lubricating Coating Systems Manufactured by High Velocity Particle Consolidation, **INVITED PRESENTATION** at Element Six, Johannesburg, South Africa, November 6th, 2007.

146. A. E. Segall***** and C. D. Knepper, "Sliding Wear of Cryogenically and Ceramic Transformed Alloys and Inverse Methods for the Determination of Interfacial Temperatures," **INVITED PRESENTATION** at Element Six, Johannesburg, South Africa, November 5th, 2007.

147. A. Segall*****, and D. Engels*****, "Remote Sensing of Transient Temperature and/or Strain Histories and The Inverse Determination of Boundary Conditions," **INVITED PRESENTATION** at the spring meeting of the Ben Franklin Center of Excellence in Structural Health Monitoring, The Pennsylvania State University, University Park, PA, April 14-15, 2008.

148. J. Weyant*, A. Segall and I. Smid, "Nano-Engineered Encapsulated Particles for the Creation of Self-Lubricating Coatings," Poster presentation at the 2008 MRI Materials Day, The Pennsylvania State University, University Park, PA, April 14-15, 2008.

149. J. Weyant*, A. Segall and I. Smid, "Nano-Engineered Encapsulated Particles for the Creation of Self-Lubricating Coatings," Poster presentation at the CISP Industry Members Meeting, University Park, PA, April 14th, 2008.

150. A.E. Segall*, D. Engels, and A. Hirsh, "Thoughts on the Deconvolution of Thermal- and Stress-States from Transient Histories," PVP2008-61824, Presented at the 2008 ASME Pressure Vessel and Piping Conference, July 27-31, Chicago, IL, 2008.

151. A. Segall*, C. Drapaca, and D. Engels*, "Remote Sensing of Temperature, Strain, Displacement etc. and the Inverse Determination of Surface Conditions," **INVITED PRESENTATION** at the High Temperature Sensor Workshop, The Pennsylvania State University, University Park, PA, November 18, 2008.

152. J. Harris, A.E. Segall*, J.R. Hellman, B. Scheetz, R. Kosecki, and J. Boyce, "Analytical and Experimental Studies of Ceramic and Glass Proppants under Simulated Well and API 60 Test Conditions," presented at the 33st International Conference and Exposition on Advanced Ceramics and Composites, Daytona Beach, Florida, January 18-23, 2009.

153. A. Segall* and R. Carter, "Probabilistic Fracture Assessments of the Response of Ceramic Cannon Barrels Including the Influence of Alternate Rifling Geometries," **INVITED KEYNOTE ADDRESS** at the CISP Industry Members Meeting, University Park, PA, April 15th, 2009.

154. D. Engels*, A.E. Segall (Presenter), and C. Drapaca, "Inverse Analysis of Thermal States from Transient Histories with Nonlinear Thermophysical Properties," PVP2009-77049, *Presented at the 2009 ASME Pressure Vessel and Piping Conference*, July 26-30, Prague, Czech Republic, 2009.

155. L. Stark* (Presenter), A. Segall, and I. Smid, "Engineered Self Lubricating Coatings Utilizing Cold Spray Technology," Poster presentation at the 2010 MRI Materials Day, The Pennsylvania State University, University Park, PA, April 14-15, 2010.

156. A. Segall*, "Advanced Materials and the Necessary Shift from Alloy-Centric Design Paradigms Required for Sustainable Development" **INVITED KEYNOTE ADDRESS** at the International Conference on Engineering Solutions for Sustainable Development, at the American University in Cairo from April 18th, 2010.

157. G. Aggarwal, I.Smid, A.E. Segall **(Presenter)**, and T.J. Eden, "High-Impact Modeling of Composite Particles in Cold Spray Coating " Presented at the 16th U.S. National Congress of Theoretical and Applied Mechanics, State College, PA, June 27 -July 2, 2010.

158. J. Harris, A.E. Segall **(Presenter)**, and R. Carter, "The Effects of Severe Thermal and Pressure Transients on the Survival of Internally Coated Tubes," PVP2009-77049, *Presented at the 2010 ASME Pressure Vessel and Piping Conference*,, Seattle, WA, July 18-22, 2010.

159. G. Aggarwal, I.Smid, A.E. Segall **(Presenter)**, and T.J. Eden, "High-Impact Modeling of Composite Particles in Cold Spray Coating " **INVITED** Presentation at the 16th U.S. National Congress of Theoretical and Applied Mechanics, State College, PA, June 27 -July 2, 2010.

160. A.E. Segall **(Presenter)**, C. Drapaca, D. Engels, "The Inverse Determination of Boundary Conditions Using a Least-Squares Approach for Both Linear and Nonlinear Problems" Presented at the 16th U.S. National Congress of Theoretical and Applied Mechanics, State College, PA, June 27 -July 2, 2010.

161. J. Harris **(Presenter)**, A.E. Segall, and R. Carter, "Severe Thermal and Pressure Transients on the Survival of Internally Coated Tubes with Interface Defects," Presented at Gun Tube M^3 Symposium: Modeling, materials, and Manufacturing technology, Aberdeen Proving Grounds, Maryland, July 7-9, 2010.

162. A.E. Segall **(Presenter)**, C. Drapaca, and D. Engels, "Inverse Determination of Thermal Boundary Conditions from Transient Surface Temperatures and Strains in Slabs and Tubes," Presented at Gun Tube M^3 Symposium: Modeling, materials, and Manufacturing technology, Aberdeen Proving Grounds, Maryland, July 7-9, 2010.

163. I. Smid **(Presenter)**, L. Stark, A.E. Segall, T. Eden, "Engineered Self-Lubricating Coatings Utilizing Cold Spray Technology", Presented at the MS&T'10 - Materials Science & Technology - Conference & Exhibition, Houston, Texas, October 17-21, 2010.

164. A.E. Segall **(Presenter)**, I. Smid L. Stark, T. Eden, "Self-Lubricating Coatings Us-ing Nickel Encapsulated, Hexagonal Boron-Nitride Created by High Velocity Particle Consolidation", Presented at Engineering Science and Mechanics seminar, February 9th, 2011.

165. J. Harris, A.E. Segall **(Presenter)**, and R. Carter, "The Influence of Severe Transients on the Evolution of Blister Type Defects between Coating and Substrate," Presented at Gun Tubes 2011, Cranfield University, UK, April 11-12, 2011.

166. A.E. Segall **(Presenter)**, C. Drapaca, D. Engels, T. Zhu, and H. Yang, "Direct and Inverse Solutions for Thermal- and Stress-Transients and the Analytical Determination of Boundary Conditions Using Remote Temperature or Strain Data," Presented at Gun Tubes 2011, Cranfield University, UK, April 11-12, 2011.

167. M. Neshastehriz*, Albert Segall, Ivi Smid, T. Eden, J. Potter, "Cold-Spray Coating on Less Common Materials," Presented at the CISP Industry Members Meeting, University Park, PA, April 14th, 2011.

168. J. Harris, A.E. Segall **(Presenter)**, and R. Carter, "Defect Evolution in Coated Tubes Under Severe Thermal Transients Applied to the ID," PVP2011-57604, Presented at the 2*011 ASME Pressure Vessel and Piping Conference*, Baltimore, MD, July 17-21, 2011.

169. B. Singh, H. Sabet, V. Nagarkar, R. Akarapu, and A.E. Segall, "Multibeam Healing for Laser Micromachining of Scintillator Arrays," Poster presentation at the 2011 Nuclear Science Symposium and Medical Imaging Conference, Valencia, Spain, October 23 - 29 2011.

170. M. Neshastehriz*, Albert Segall, Ivi Smid, T. Eden, J. Potter "Composite Ni-Encapsulated Hexagonal Boron-Nitride Particles for Self-Lubricating Coatings," Poster presentation at the 2012 MRI Materials Day, The Pennsylvania State University, University Park, PA, April, 2012.

171. A. Segall, "Interfacial Wear Temperatures with a Receding Boundary with Implications for Tribotesting," Presented at the 2012 STLE Annual Meeting, St. Louis, MI, May, 2012.

172. J. Harris, A.E. Segall **(Presenter)**, and R. Carter, "Defect Evolution on Coated Samples Under Severe Thermal Transients and Interfacial Characterization" PVP2012-78358, Presented at the 2*012 ASME Pressure Vessel and Piping Conference*, Toronto, Canada, July 16-20, 2012.

173. A.E. Segall **(Presenter)**, I. Smid, L. Stark, P. Walia, M. Neshastehriz, T. Eden, and J. Potter "Development and Evaluation of Superior hBN Based Self-Lubricating Coating Systems Created by High Velocity Particle Consolidation (HVPC)," **INVITED** Presentation at the Calgary Chapter of STLE and Finney/OEM Corporation, Edmonton, Canada, August 7th, 2012.

174. M. Neshastehriz* (Presenter), I. Smid, A.E. Segall, T. Eden,L. Stark, and J. Potter "Composite Ni-Encapsulated Particles for Cold-Spray: hexagonal Boronitride, Aluminum, Nickel, Copper," Presented at the Materials Science & Technology 2012, Pittsburgh, PA, October 10, 2012.

175. M. Neshastehriz* (Presenter), I. Smid, A.E. Segall, L. Stark*, and T.J. Eden, "Cold Spray Coating on Aluminum Substrates with Nickel Encapsulated lubricant Particles," Presented at CERS, University Park, PA, April, 2013.

176. M. Neshastehriz* (Presenter), I. Smid, A. Segall, T. Eden, J. Potter, and L. Stark*, "Self-Lubricating Ni-Encapsulated Hexagonal Boron Nitride Coatings via Cold-Spray," Presented at ESM Today, University Park, PA, March, 2013.

177. M. Neshastehriz* (Presenter), I. Smid, A. Segall, T. Eden, J. Potter, and L. Stark*, "Synthesis of Nickel-Encapsulated Particles for Deposition with Cold-Spray," Presented at the Penn State Graduate Exhibition, University Park, PA, March, 2013.

178. M. Neshastehriz* (Presenter), I. Smid, A. Segall, L. Stark*, and T. Eden, "Synthesis of Nickel-Encapsulated Particles for High-Strain-Rate Deposition in Cold-Spray," Presented at TMS, San Antonio, TX, March, 2013.

179. P.J Blau, K.M. Cooley, D. Bansai, I. Smid, T.J. Eden, M. Neshastehriz*, J.K. Potter, and A.E. Segall, "Spectrum Loading Effects on the Running-in of Lubricated Bronze and Surface Treated Titanium against Alloy Steel," Presented at Wear of Materials, Portland, OR, April 15-18, 2013.

180. J. Harris*, A.E. Segall (Presenter), D. Robinson*, and R. Carter, "Interfacial Blister Evolution of Coated Surfaces under Severe Thermal and Pressure Transients" PVP2013-97596, Presented at the 2013 ASME Pressure Vessel and Piping Conference, Paris, France, July 14-18, 2013.

181. A.E. Segall, I. Smid, T. Eden, M. Neshastehriz, and J. Potter, "Wear and Reparability Evaluations of a New Class of Super Self-Lubricating hBN- Ni Coatings," Presented at the 2013 STLE Annual Meeting, Detroit, MI, May, 2013.

182. A. Segall, "In Situ Determination of Interfacial Wear Temperatures using an Inverse Approach," Presented at the 2014 STLE Annual Meeting, Orlando, FL, May, 2014

183. T. Eden*, I. Smid, A. Segall, D. Wolfe, M. Neshastehriz and J. Potter, and J. Schreiber, "Application and Analysis of Self Lubricating Coatings," Presented at the North American Cold Spray Conference, Bromont, Québec, September 16-17, 2014.

184. M. Neshastehriz*, I. Smid, A.E. Segall, T.J. Eden, J.K. Potter, "Microstructure Conditioning of Self-Lubricating hBN-Ni Particles Using High- and Low-Energy Ball Milling for Cold Spray Coatings on Aluminum", presented at MS&T'14, Pittsburgh, PA, Oct 2014.

185. M. Neshastehriz*, I. Smid, A.E. Segall, and T.J. Eden, "Microstructure of Cold Sprayed hBN-Ni and Ni-Ni Composite Powders", presented at TMS 2015, Orlando, FL, March 16, 2015.

186. A.E Segall, T.J. Eden, F. B. Cheung, and J. Potter, "Tribotesting of Cold-Spray Micro-Porous Coatings that can Reservoir Lubrication," Presented at the 2015 STLE Annual Meeting, Dallas, TX, May, 2015.

187. A.E. Segall, T. Eden, B. Cheung, and J. Potter, "Cold-Spray Micro-Porous Coatings for Higher Critical Heat Flux levels for Emergency Cooling of Reactors, **INVITED PRESENTATION** at the UJV Rez Workshop on IVR status for VVER 1000 Designs, Prague, Czech Republic, June, 2015.

188. F.A. Sohag, F.R. Beck, L. Mohanta, F.B. Cheung*, A.E. Segall, T.J. Eden, and J. Potter, "Enhancement of Downward Facing Boiling Heat Transfer by the Cold Spray Technique" Presented at NURETH 16, the 16th International Topical Meeting on Nuclear Reactor Thermal Hydraulics, Chicago, Ill, August 30-September 4, 2015.

189. J. Schreiber*, I. Smid, T.J. Eden, A.E. Segall, and V, Champagne, "A Finite Element Approach to Deformation of Encapsulated Particles in Cold Spray," Poster Presentation at Penn State Materials Day, University park, PA, September 28-29, 2015.

190. A.E. Segall, T. Eden, B. Cheung, and J. Potter, "Cold-Spray Micro-Porous Coatings for Higher Critical Heat Flux levels for Emergency Cooling of Reactors, **INVITED PRESENTATION** to the Department of Energy (DOE), Washington, DC, December, 2015.

191. A.E. Segall, F.B. Cheung, T.J. Eden, J. Potter, F.A. Sohag, F.R. Beck, and L. Mohanta, "Cold-Spray Micro-Porous Coatings and Enhanced CHF for Downward Facing Boiling During Passive Emergency Reactor Cooling," Presented as an Engineering Science and Mechanics Seminar, The Pennsylvania State University, University Park, PA, March 3rd, 2016.

192. A.E. Segall, F.A. Sohag, F.R. Beck, L. Mohanta, F.B. Cheung, T.J. Eden, and J. Potter, Micro-Porous Coatings and Enhanced CHF for Downward Facing Boiling During Passive Emergency Reactor Cooling" Presented at the 2016 ASME Pressure Vessel and Piping Conference, Vancouver, Canada, July 17-21, 2016.

193. T.J. Eden, J. Žďárek, A.E. Segall, and F.B. Cheung, "Microporous Coatings for Enhanced Heat Transfer and Steam Impulse Tube Repair," Presented at the North American Cold Spray Conference, Edmonton, Alberta, Canada, November 30-December 1, 2016.

194. A.E. Segall, "Cold-Spray Additive Manufacturing Methods for Tailored Materials and Surfaces," **INVITED PRESENTATION** at IndustryXchange, The Pennsylvania State University, May 24, 2017.

195. A.E. Segall, F.B. Cheung, T.J. Eden, I. Smid, T.J. Eden, L. Stark, M. Neshastehriz, J. Potter, F.A. Sohag, F.R. Beck, and L. Mohanta, "A New Class of Tailored Coatings and Materials Created using Cold-Spray Additive Manufacturing Methods," **INVITED PRESENTATION**, The University of Thessaly, Volos, Greece, March 5th, 2018. Note: due to the March 2018 Nor'easter, travel was disrupted and this talk was postponed.

196. A.E. Segall "Science Fiction as a Valuable Tool in Engineering Instruction: To Boldly Go Where No Educator Has Gone Before!," **INVITED PRESENTATION**, The National Technical University of Athens, Athens, Greece, March 8th, 2018.

197. Y. Abuzeid, C. Drapaca, and A.E. Segall, "Analytical Solutions to the Heat Equation in Domains with a Moving Boundary," Poster presentation at the 2018 Multi-Campus Research Experience for Undergraduates (REU) Research Symposium, University Park, PA, 2018.

198. A.E. Segall, C.C. Schoof, and D.E. Yastishock, "Thermal Solutions for a Plate with an Arbitrary Temperature Transient on one Surface and Convection on the other: Direct and Inverse Formulations**,"** Presented at the ASME Pressure Vessel and Piping Conference, San Antonio, Texas, July 15-19, 2019.

199. I.W. Reiman, A.E Segall, X., and T. Palmer, "Combining Fractal and Topological Analyses to Quantify Fracture Surfaces in Additively Manufactured Ti-6Al-4V", Presented at Additive Manufacturing Benchmarks 2022, Bethesda, MD, August 15-18, 2022.

RESEARCH CONTRACTS AND GRANTS

1. 7/1986-7/1989, “Radiant Tube Technology-Component Test and Design Verification,” Gas Research Institute, $350,000, Co-PI, 50%.

2. 12/1989-5/1992, “Thermal Shock Behavior of Tubular Ceramics-Testing and Modeling,” Gas Research Institute, $316,500, Co-PI/Associate, 50%.

3. 5/1993-8/1994, “Thermal Shock Round-Robin Program,” Gas Research Institute, $95,758, Co-PI, 50%.

4. 1/1992-12/1993, “Analytical and Engineering Services,” Gas Research Institute and Individual Corporations, $200,000, Co-PI, 50%.

5. 7/1993-12/1995, “Development of a High Temperature Radiant Tube Test Facility (HTRTTF),” Columbia Gas, Consolidated Natural Gas, Gas Research Institute, Hauck Manufacturing, National Fuel Gas, and Union Gas of Canada, $470,000 (approximate total of ongoing effort), PI, 100%.

6. 1/1993-12/1993, “Energy Meter Proof-of-Concept Study,” Equimeter Incorporated, $50,000, Co-PI, 50%.

7. 7/1995-12/1996, “Analytical and Engineering Services for High Temperature Materials Research,” Gas Research Institute, $540,000, PI, 100%.

8. 1/1995-12/1995, “Water-Brake Analysis and Redesign-Task I,” ONR/NAWC-LKE, $75,000, Co-PI, 50%.

9. 1/1996-6/1997, “Water-Brake Analysis and Redesign-Task II,” ONR/NAWC-LKE, $75,000, Co-PI, 50%.

10. 1/1996-12/1998, “Water-Brake Analysis and Redesign (Design Optimization)-Task III,” ONR/NAWC-LKE, $200,000, Co-PI, 50%.

11. 1/1995-12/1995, “Thermomechanical Characterization of the ThermoTrex CVC SiC for High Temperature Vacuum Applications,” Surface Combustion Inc., $35,000, PI, 100%.

12. 1/1996-12/1998, “Arresting-Gear Life-Cycle Improvement,” ONR/NAWC-LKE, $150,000, Co-PI, 50%.

13. 1/1996-12/1996, “Fatigue and Corrosion Performance of P/M Stainless Steel Materials for Exhaust Applications,” Alpha Sintered Metals and Hoeganaes Corporation, $37,500, Co-PI, 50%.

14. 1/1997-12/1997, “High Temperature Sliding Wear Evaluation of Ion-Implanted, Ti Developed to Reduce Fretting Wear and Fatigue in Turbine Engine Applications,” Orenda Aerospace, $15,000, Co-PI, 50%.

15. 6/1997-10/1997, “Reduction of Wear and Fretting of a Titanium, Barrel Assembly,” ONR/NAWC-LKE, $40,000, PI, 80%.

16. 11/1997-7/1998, “Creep and Corrosion Performance of Stainless P/M Stainless Steel Materials for Exhaust Applications,” Alpha Sintered Metals and Hoeganaes Corp., $33,000, Co-PI, 50%.

17. 1/1997-7/1997, “Development of the Cold Spray Coating Method to Assist the Magna Welding Process,” DANA-Spicer Driveshaft Division, $11,000, PI, 90%.

18. 7/1997-2/1998, “Utilization of a Cold Spray Coating Process for the Enhancement of Titanium,” Battelle Pacific Northwest Laboratory and DOE Innovative Concepts (InnConn) Program, $22,000, PI, 90%.

19. 12/1998-12/2001, “F/A-18 F404 Fretting and Low-Cycle Fatigue Amelioration,” ONR/NAVAIR, $626,000 (approximate), Co-PI, 50%.

20. 1/1998-12/1999, “Reduction of Wear Experienced by the Catapult Launching Pistons,” ONR/NAWC-LKE, $30,000, PI, 80%.

21. 1/1999-12/2000, “Tribological Evaluation of Candidate Materials and Coatings for the Extension of Piston Life and the Reduction of Grease Usage,” ONR/NAWC-LKE, $50,000, Co-PI, 50%.

22. 1/2001-12/2005, "CAREER: Development of a Split-Beam Method for Improved Laser Machining of Ceramics", NSF, $375,000, PI, 100%.

23. 1/2001-12/2002, "Optimization of Sizing and Finishing Processes for the Manufacturing of Sapphire Wafers,", Washington Technology Center (WTC) and Bicron Crystal Products, $110,000, PI, 80%.

24. 9/2004-9/2005, “Development and Evaluation of Wear Resistant Aluminum Alloys and Surface Transformations for Sheave Wheel Applications,” NAVAIR/NAWC, $50,000, PI, 95%.

25. 9/2003-5/2005, “Densification Stresses and Distortion Produced by Density Gradients” Particulate Materials Center, $60,000, Co-PI, 33%.

26. 6/2004-7/2004, “Quantification of Thermophysical and Evolving Strength Properties of Alumina Ceramics during Dual-Beam Laser Machining,” SURA/ORNL Summer Cooperative Research Program, $6,500, PI, 100%.

27. 8/1999-12/2003, “Constitutive Material Properties and Belt Edge Durability of Radial Tires” Pirelli Coordinamento Pneumatici, $146,999, Contributor since 2002, 0%.

28. 8/2004-3/2007, “Self-Lubricating Coatings for Elevated Temperature Applications using a Microwave-Assisted High-Velocity-Particle-Consolidation (HVPC) Process,” AFRL/MLKN, $125,000, PI, 33%.

29. 7/2003-7/2005, “Nanostructured Protective Coatings” Air Force Research Laboratory, $300,000 (PSU portion of $833,000 total), Contributor, ~4%.

30. 7/04-6/08, "Proppants Engineered from Discarded Industrial Materials," Halliburton, $400,000, Co-PI, 33%.

31. 7/05-6/06, “Development and application of Lasers and Electro-Optic beam control for Micromachining,” Electro-Optics Center, $76,000, PI, 100%.

32. 8/06-7/07, “Surface Defect Healing using Dual Beam/Multi-Pass CO_2 and Excimer Laser,” NSF as part of an SBIR from RMD Inc., $200,000, PI, 33%.

33. 6/06-9/07, “Erosion Wear Tests of Candidate Coatings Systems using the High-Velocity-Particle-Consolidation (HVPC) Process,” Kennametal, $20,000, PI, 90%.

34. 7/06-6/07, “Nano-Engineered Encapsulated-Particles for the Creation of Self-Lubricating Coatings and Alloys,” CISP, $40,000, Co-PI, 50%.

35. 1/07-12/09, “A Predictive Modeling and Experimental Investigation of Laser Sustained Plasma (LSP) and its Potential Application to Materials Processing,” ONR, $312,618, Contributor.

36. 10/07-9/08, “Thermomechanical Evaluation and Modeling of Sintered Particulate Filters,” MiMark Industries, $75,000-100,000, Co-PI, 33%.

37. 1/09-12/12, “Self-Lubricating Coatings/Alloys that are both Repairable and Functionally Gradable using High-Velocity-Particle-Consolidation,” ONR, $450,000, Co-PI, 33%.

38. 8/08-12/08, “Influence of Lasers on Strength,” Electro-Optics Center, $50,000, PI, 100%.

39. 12/08-12/11, “Thermal Stress Management of Materials and Coatings,” Army Research Laboratory (ARL), PI, 100%, $225,000.

40. 12/08-12/09, “Nuclear Oxide Fuel Fabrication and Process Modeling Utilizing Field Activation and Employing the Spark Plasma Sintering Method,” DOE, PSU portion $140,000 (from $1,000,000), PI, 100%.

41. 7/11-7/13, “Surface Defect Healing using Dual Beam/Multi-Pass CO_2 and Excimer Laser,” NIH as part of an SBIR Phase II with RMD Inc., $450,000 ($200,000 PSU portion), PI, 100%.

42. 8/13-9/13, “Porous Self-Lubricating Coatings Directly Applied to Reactor Vessels for Enhanced, Downward Boiling Heat-Transfer during Emergency Reactor Flooding,” Phase I , UJV Res. (Czech Republic), $0, Co-PI, 50%.

43. 10/13-12/14, “Phase II: Porous Coating Development/Demonstration of Enhanced Boiling Heat Transfer,” UJV Res. (Czech Republic), $243,000, Co-PI, 33%.

44. 5/15-8/15, “Characterization of Stiffness of Corning Cellular Ceramic Using Scanning Acoustic Microscopy: Feasibility Study, Corning, $16,000, Co-PI, 50%.

45. 1/16, DURIP: “Multifunctional Additive/Subtractive Manufacturing and Repair System,” ONR, $900,000, Co-PI, 25%

46. 1/17, DURIP: “A Multi-Function Tribometer for Essential Research and Graduate Education on Materials, Wear, Corrosion, and Protective Coatings,” ONR, $257,730, PI, 100%

47. 5/18-1/19, “Tribological Studies of SiC and Carbon Infused SiC for Bearings and Seals”, Morgan Advanced Materials, $54,061, PI, 100%

48. 1/19-10/20, “Tribological Studies of Candidate Materials”, Morgan Advanced Materials, $75,000, PI, 100%

49. 1/19-2/19, “Hot Hardness Testing for Lehigh University”, Lehigh University, $6000, PI, 100%

50. 11/19-10/22, “Rapid Identification of Effects of Defects within Metal Additive Manufacturing - Phase II,”, $450,000, Co-PI, 25%

51. 8/19-9/20, “Manufacturing/Wear Optimization of Resin-Bonded Composites with Graphene Nanofillers,” $145,598, PA Manufacturing Fellows Initiative and Morgan Advanced Materials, PI 100%

Student Teaching Evaluations from 2002-Present (Penn State only); all scores are based on a maximum value of 7

Crs/No./Sec.	Enrol.	Elective%	Sem/Yr.	No. Rspdts. (%)	Overall Quality of Course	Overall Quality of Instruction
E MCH 215 001	46	0	FA02	28 (61%)	5.37	**6.14**
E MCH 416H 001	15	0	SP03	8 (53%)	5.88	**5.63**
E MCH 500 001	12	33	FA03	12 (100%)	5.55	**5.36**
E MCH 416H 001	30	19	SP04	26 (87%)	5.53	**6.35**
E SC 121S 001	8	75	SP04	8 (100%)	6.00	**6.13**
E MCH 215 001	47	4	FA04	43 (92%)	5.79	**6.23**
E MCH 215 002	47	2	FA04	40 (85%)	5.65	**6.20**
E MCH 416H 001	32	8	SP05	27 (84%)	5.93	**6.22**
E MCH 215 003	85	8	FA05	60 (73%)	5.72	**6.33**
E MCH 215 004	85	4	FA05	48 (59%)	5.56	**6.17**
E MCH 597C 001	7	29	SP06	7 (100%)	5.14	**6.14**
E MCH 400 001	30	91	FA06	22 (73%)	5.55	**5.91**
E MCH 416H 001	26	32	SP07	22 (85%)	5.73	**6.00**
E MCH 215 002	72	7.8	SP07	51 (71%)	5.29	**6.08**
E MCH 400 001	29	70	FA07	23 (79%)	5.26	**5.87**
E MCH 500 001	16	38	FA07	13 (81%)	5.31	**5.69**
ME 560 001	13	38	FA07	13 (100%)	5.54	**6.08**
E MCH 416H 001	30	48	SP08	25 (83%)	4.76	**4.72**
E MCH 400 001	21	21	FA08	14 (67%)	5.36	**5.71**
E SC 121S 001	8	24	FA08	21 (95%)	6.38	**6.48**
E MCH 416H 001	36	62	SP09	34 (95%)	5.06	**5.29**
E MCH 400 001	37	79	FA09	24 (65%)	5.88	**6.29**
E MCH 416H 001	39	67	SP10	9 (23%)	5.56	**5.56**
E MCH 400 001	33	72	FA10	25 (76%)	5.60	**6.08**
E MCH 416H 001	40	50	SP11	35 (88%)	6.06	**6.34**
E MCH 400 001	39	79	FA11	24 (61%)	6.00	**6.46**
E MCH 416H 001	32	70	SP12	14 (44%)	5.79	**6.38**
E MCH 400 001	36	57	FA12	19 (53%)	5.68	**6.16**
E MCH 416H 001	26	73	SP13	14 (54%)	5.86	**6.14**
E MCH 400 001	38	57	FA13	23 (61%)	6.05	**6.59**
E MCH 416H 001	23	56	SP14	9 (39%)	5.44	**5.78**
E MCH 416H 002	16	67	SP14	11 (69%)	5.82	**6.27**
E MCH 400 001	32	72	FA14	20 (63%)	6.35	**6.70**
E MCH 416H 001	17	50	SP15	9 (53%)	5.11	**5.78**
E MCH 400 001	37	92	FA15	17 (46%)	6.00	**6.71**
E MCH 500 001	6	100	FA15	2 (33%)	6.00	**6.00**
ME 560 001	14	33	FA15	6 (43%)	5.67	**6.50**
E MCH 416H 001	25	88	SP16	10 (40%)	6.00	**6.00**

E MCH 400	001	39	92	FA16	20 (51%)	6.30	**6.70**
E MCH 416H	001	33	92	SP17	13 (40%)	6.23	**6.46**
E MCH 536	001	7	50	SP17	4 (57%)	6.75	**7.00**
E MCH 400	001	38	92	FA17	18(48%)	5.83	**6.39**
E MCH 500	001	9	50	FA17	6 (67%)	6.17	**6.33**
ME 560	001	14	100	FA17	7 (50%)	6.14	**6.43**
E MCH 416H	001	23	60	SP18	6 (26%)	5.83	**5.83**
E MCH 400	001	35	87	FA18	30(86%)	5.90	**6.47**
E MCH 416H	001	29	52	SP19	28 (96%)	5.21	**5.32**
E MCH 416H	002	25	31	SP19	24 (96%)	5.78	**6.04**
E MCH 400	001	35	45	FA19	31(89%)	6.48	**6.55**
E MCH 500	001	10	60	FA19	9 (90%)	5.67	**5.89**
ME 560	001	6	100	FA19	3 (50%)	6.67	**7.00**

Average (51) = 5.76 **Average (51) = 6.15**

Note: Due to Covid-19 and subsequent Faculty Senate changes, Student Teaching Evaluations were halted for 2020 and then changed significantly starting SP2021.

Semester & Year	Course	Enrollment	Respondents	Overall Quality of Course	Overall Quality of Instructor
Spring 2022	EMCH 416 001	17	25%	Median: ?.00 Mode: ?.00	Median: ?.00 Mode: 7.00
Fall 2021	EMCH 500 001	9	33.3%	Median: 6.00 Mode: 6.00	Median: 6.00 Mode: 6.00
Fall 2021	ESC 121 001	24	33.3%	Median: 6.00 Mode: 7.00	Median: 6.00 Mode: 7.00
Fall 2021	ME 560 001	8	75%	Median: 6.00 Mode: 6.00	Median: 7.00 Mode: 7.00
Spring 2021	EMCH 416 001	21	91%	Median: 6.00 Mode: multi-modal	Median: 6.00 Mode: 7.00
Spring 2021	EMCH 416 002	21	100%	Median: 6.00 Mode: 6.00	Median: 6.00 Mode: 7.00