ANDREW ALAN WERESZCZAK

WORK
OAK RIDGE NATIONAL LABORATORY
MATERIALS SCIENCE AND TECHNOLOGY DIVISION
OAK RIDGE, TN 37831-6068
PH: (865) 576-1169
FAX: (865) 574-6098
E-MAIL: wereszczakaa@ornl.gov

PROFESSIONAL INTERESTS

Mechanical Response of Materials and their Linkage to Processing
Contact Damage Resistance and Microstructures in Armor Ceramics
Interconnect Processing of Electronic Ceramic Components and Devices
Mechanical Reliability of Electronic Ceramic Components and Devices
Thermal Management of Power Electronic and Electric Motor Devices
Probabilistic Life Prediction and Design of Structural Ceramic Components
Micromechanical and In-Situ Testing/Analysis of Ceramics and Coatings
Fracture Mechanics, Finite Element Method, and Applied Mathematics
Fatigue and Creep Phenomena in Ceramic and Structural Materials
Mechanical Test and Analysis Methods

EDUCATION

Ph. D., MATERIALS SCIENCE AND ENGINEERING
University of Delaware, Newark, Delaware - August 1992

B. S., CERAMIC ENGINEERING
Alfred University, Alfred, New York - December 1987

PROFESSIONAL EXPERIENCE

DISTINGUISHED SCIENTIST [1/2009 - present]
Ceramic Science and Technology Group
High Temperature Materials Laboratory
Materials Science and Technology Division
Oak Ridge National Laboratory
Oak Ridge, TN 37831

Principal investigator (PI) of DOE- and DOD- and industry-sponsored programs that: (1) perform reliability analysis and probabilistic design of thermoelectric devices, (2) process thermally conductive epoxy molding compounds, (3) characterize contact damage evolution in armor ceramics and link to material microstructure, (4) improve and refine silver-sinter processing as a joining mechanism between constituents in electronic devices, (5) nurtures thermal management analysis collaboration between ORNL/NTRC and NREL on the EERE VT APEEM Program, and (6) link non-destructive evaluation of surface-type flaws and corresponding mechanical response of glass.

Secondary investigator (SI) of DOE-sponsored programs that: (7) evaluate the architecture and constituents of state-of-the-art power electronic devices and motor components, (8) provide Ag-sintering and microstructural evalution support to WBG electronic devices fabricated under the EERE VT APEEM Program, and (9) provide characterization and processing support of automotive OEM thermoelectric module development.

SENIOR STAFF SCIENTIST [9/2002 - 12/2008]
Ceramic Science and Technology Group
High Temperature Materials Laboratory
Materials Science and Technology Division
Oak Ridge National Laboratory
Oak Ridge, TN 37831

Adjoint Faculty [1/2006 - present]
Department of Mechanical Engineering
Vanderbilt University
Nashville, TN 37235

MATERIALS ENGINEER DB IV [5/2002 - 8/2002]
MATERIALS ENGINEER DB III [5/2000 - 5/2002]
Emerging Materials and Analysis Team
Metals and Ceramics Research Branch
Weapons and Materials Research Directorate
U.S. Army Research Laboratory
Aberdeen Proving Ground, MD 21005

Manager and PI of $5.9M, four-year Ceramic Gun Barrel Technology Scientific and Technical Objective (STO). PI of Phenomenology and Physics of Ceramic Failure in Armor Ceramics. PI of Vehicular Ceramic Armor Defeat Mechanisms.

STAFF DEVELOPMENT ENGINEER II [9/1996 - 5/2000]
STAFF DEVELOPMENT ENGINEER I [9/1992 - 9/1996]
DEVELOPMENT ASSOCIATE III [11/1991 - 9/1992]
Mechanical Characterization & Analysis Group
High Temperature Materials Laboratory
Metals and Ceramics Division
Oak Ridge National Laboratory
Oak Ridge, TN 37831

Directed the research, or participated, on five DOE-funded programs between 11/1991-5/2000: (1) the Mechanical Properties User Center at the High Temperature Materials Laboratory, (2) the Heavy Vehicle Propulsion System Materials Program, (3) the Advanced Automotive Materials Program, (4) the Advanced Industrial Materials Program, and (5) the Industrial Microturbine Development Program. Was principal

investigator on the latter four programs. Responsibilities that were common to all these programs were technical management, experimental design and organization, materials and mechanical testing and analyses, interpretation of results and their presentation and publication, milestone accomplishment, and industry collaboration.

PATENTS & COPYRIGHTS & INVENTION DISCLOSURES

Hermetic Coating of Hard Armor Shapes, A. A. Wereszczak, K. Leighton, and J. Carberry, Invention Disclosure Number 201303095, DOE S-124,679, May, 2013.

Mechanical Improvement of Automotive Wireless Charger Ferrite Ceramic Flux Guides, A. A. Wereszczak, J. M. Miller, and C. Coomer, Invention Disclosure Number 201303056, DOE S-124,638, April, 2013.

Improved Sintered Silver Joints via Controlled Topography of Electronic Packaging Subcomponents, A. A. Wereszczak, Docket 8490-90660-01, March, 2013.

Gas Pressure Sintering of Silver Interconnections and Bonded Joints, A. A. Wereszczak and V. Grosu, Invention Disclosure Number 201303018, DOE S-124,598, February, 2013.

Novel Power Module Packaging Concept with Ceramics, M. S. Chinthavali and A. A. Wereszczak, Invention Disclosure Number 201303015, DOE S-124,595, February, 2013.

Hybrid-Filled Epoxy Molding Compositions, A. A. Wereszczak, Invention Disclosure Number 201202955, DOE S-124,532, October, 2012.

Selective Dicing Direction for GaN on Silicon, A. A. Wereszczak, Invention Disclosure Number 201202788, DOE S-124,350, September, 2012.

Improved Die and Lead Frame Bonding Via Directional Topography, A. A. Wereszczak, Invention Disclosure Number 201202788, DOE S-124,350, September, 2012.

Bonding Strategy for Large Area Metal-Cladded Ceramic Substrate, A. A. Wereszczak and V. Grosu, Invention Disclosure Number 201202788, DOE S-124,350, September, 2012.

Electrically Insulative Enameled Aluminum Substrates and Heat Sinks, A. A. Wereszczak, G. N. Pfendt, and R. A. Wallace, , Invention Disclosure Number 201202788, DOE S-124,350, January, 2012.

Sintered Polycrystalline Silicon Thermoelectrics (SinPolySiTEs), A. A. Wereszczak and J. J. Carberry, Invention Disclosure Number 201102599, DOE S-124,156, April 2011.

Thermally-Conductive, Electrically-Insulating, Silicon-Containing Epoxy Molding Compounds (Si-EMCs), A. A. Wereszczak and J. J. Carberry, Invention Disclosure Number 201102561, DOE S-124,118, February 2011.

Glass Strengthening and Patterning Methods, A. A. Wereszczak and D. C. Harper, submitted patent application, November, 2010.

Formation of Thermoelectric Elements by Net Shape Sintering, J. R. Salvador, J. Yang, and A. A. Wereszczak, Invention Disclosure Number 201002405, DOE S-115,452, April 2010.

Direct Cooled Power Electronics Substrate, R. H. Wiles, A. A. Wereszczak, C. W. Ayers, and K. T. Lowe, Patent Publication No. US-2009-0231812-A1, 17 September 2009.

Permanent Multifunctional Patterning of Glass Surfaces Using Infrared Heating, A. A. Wereszczak, and D. C. Harper, Invention Disclosure Number 200902260, DOE S-115,296, May 2009.

Surface and Edge Strengthening of Glass Using Arc Lamp Heating, A. A. Wereszczak, and D. C. Harper, Invention Disclosure Number 200902256, DOE S-115,292, May 2009.

Dual-Rod Piezodilatometer and Method for Testing a Piezoceramic Plate, H. Wang, A. A. Wereszczak, and H. -T. Lin, Invention Disclosure 2179, November, 2008.

Indenter Displacement Transducer, A. A. Wereszczak, invention disclosure, 05-318, 1810, October 2006.

Functionamels, A. A. Wereszczak, W. M. Carty, and D. Edwards, invention disclosure 1744, DOE S-108,746, August 2006.

Functionamels, A. A. Wereszczak, W. M. Carty, and D. Edwards, patent application, Attorney Docket 63482.US (1744), Serial Number 11/865,104, August 2011.

μ-FEA, M.K. Ferber and A. A. Wereszczak. Copyright registration No. TXu1-234-195, April, 2005. Software converts digital micrographs (e.g., showing material microstructure) to ANSYS finite element input files.

OTHER RELEVENT EXPERIENCE

CONSULTANT (1997 to 2000, 2006-present)
Structural ceramics.

GRADUATE RESEARCH ASSISTANT (June 1988-October 1991)
Materials Science and Engineering Program, University of Delaware

GRADUATE TEACHING ASSISTANT (Spring 1988)
Materials Science and Engineering Program, University of Delaware

COOPERATIVE EDUCATION (July - December 1986)
Carborundum, Fibers Division, Whirlpool Tech. Center, Niagara Falls, NY.

TEACHING & ADVISORY EXPERIENCE

Advised and supervised 9 Post-BS ORISE students during the last 7 years. Students performed a multitude of supportive testing and processing. 7 of the 9 have gone on to graduate school.

Instructed over 20 engineers from industry, and over 30 students and faculty members from many universities on how to use various instruments in ORNL/HTML's Mechanical Properties User Center US Army Research Laboratory Metals and Ceramics Research Branch. Instruction provided on (1) laboratory and testing safety procedures, (2) experimental design, (3) how to conduct valid mechanical tests, and (4) how to appropriately reduce and interpret data and results.

Supervised an ORNL Post-doctoral researcher who later became an ORNL staffmember (Hong Wang). The researcher performed high rate deformation testing of structural ceramics and piezoelectric ceramics.

Co-advised (with Prof. Mark Hadfield, Bournemouth Univ.) a PhD student from Bournemouth University, UK. The student performed rolling contact fatigue studies on ceramic roller element materials.

Co-advised PhD students from New Mexico State University and the University of Missouri at Rolla. The students respectively worked at ORNL on the life prediction of ceramic diesel exhaust valves and the characterization of fusion-cast aluminas.

Co-advised a M.S. student from the Norwegian University of Science and Technology, Trondheim. The student developed models to predict the high temperature mechanical deformation of an AZS refractory.

Provided supervision to >10 engineering undergraduate students. Students were instructed and assisted in the following characterization and analyses of structural materials: transmission electron microscopy, ceramic strength

testing, stress relaxation data analysis, thermal shock strength testing, and high temperature fracture toughness testing.

Twice participated in the Summer Program of the Appalachian Regional Council student program. These high school students performed two-week-long projects involving the strength characterization of ceramics.

PROFESSIONAL AFFILIATIONS & ACTIVITIES

Fellow, American Ceramic Society (ACerS)
Associate Editor, Internal Journal of Applied Glass Science
ACerS Engineering Ceramics Division Officer Positions:
Awards Chair (2004-2005)
Secretary (2005-2006)
Vice-Chair & Treasurer (2006-2007)
Chair-Elect (2007-2008)
Chair (2008-2009)
Advisor (2009-2011)
Senior Member, Institute of Electrical and Electronics Engineers (IEEE)
American Society for Testing and Materials (ASTM)
C28 (Advanced Ceramics)

PROGRAM CHAIR
32nd International Conference on Advanced Ceramics and Composites, Daytona Beach, FL, January 27 - February 01, 2008.

EDITOR

- 2008 Ceramic Engineering and Science Proceedings (CESP), 32nd International Conference on Advanced Ceramics and Compositions, Volume 29, 2008.

- 2006 Ceramic Engineering and Science Proceedings (CESP), 30th International Conference on Advanced Ceramics and Compositions, Volume 27, Issues 2-8, 2006.

SYMPOSIUM/SESSION ORGANIZER

- *Ceramic Armor*, 37th International Conference on Advanced Ceramics and Composites, Daytona Beach, FL, January, 2013.
- *Ceramic Armor*, 36th International Conference on Advanced Ceramics and Composites, Daytona Beach, FL, January, 2012.
- *Ceramic Armor*, 35th International Conference on Advanced Ceramics and Composites, Daytona Beach, FL, January, 2011.
- *Mechanical Properties*, 35th International Conference on Advanced Ceramics and Composites, Daytona Beach, FL, January, 2011.
- *Ceramic Armor*, 34th International Conference on Advanced Ceramics and Composites, Daytona Beach, FL, January, 2010.
- *Ceramic Armor*, 33rd International Conference on Advanced Ceramics and Composites, Daytona Beach, FL, January, 2009.

- *Ceramic Armor*, 32nd International Conference on Advanced Ceramics and Composites, Daytona Beach, FL, January 27 - February 01, 2008.
- *Ceramic Armor*, 31st International Conference on Advanced Ceramics and Composites, Daytona Beach, FL, January 21-26, 2007.
- *Ceramic Armor*, 30th International Conference on Advanced Ceramics and Composites, Cocoa Beach, FL, January 22-27, 2006.
- *Reliability of Ceramic and Composite Components: Analysis, Prediction, and Design*, 29th International Conference on Advanced Ceramics and Composites, Cocoa Beach, FL, January 23-28, 2005.
- *Topics in Ceramic Armor*, 29th International Conference on Advanced Ceramics and Composites, Cocoa Beach, FL, January 23-28, 2005.
- *Ceramics & Components in Energy Conversion Systems*, 28th International Conference on Advanced Ceramics and Composites, Cocoa Beach, FL, January 25-30, 2004.
- *Mechancal Behavior and Design of Engineering Ceramics and Composites,* 27th International Conference on Advanced Ceramics and Composites, Cocoa Beach, FL, January 26-31, 2003.
- *Topics in Ceramic Armor,* 27th International Conference on Advanced Ceramics and Composites, Cocoa Beach, FL, January 26-31, 2003.

REVIEWER

- Journal of the American Ceramic Society
- International Journal of Applied Glass Science
- International Journal of Applied Ceramic Technology
- Journal of Materials Science
- Acta Materialia
- Materials Science and Engineering
- Journal of Engineering for Gas Turbines and Power
- Journal of Engineering Materials and Technology

PROFESSIONAL AND ACADEMIC HONORS

- 2012 John F. McMahon Lecturer, Alfred University, Alfred, NY.
- Fellow, American Ceramic Society, 2011
- 2008 American Ceramic Society's Richard M. Fulrath Award Winner.
- Honorary Member, DCERN, Ministry of Defence, United Kingdom.
- Best Poster Award, 31st International Conference on Advanced Ceramics and Composites, Daytona Beach, FL, 2007.
- Best Poster Award, 30th Annual Conference on Advanced Ceramics and Composites, Cocoa Beach, FL, 2006.
- A. W. Allen Award, Biannual award for the finest published paper regarding refractories, April 2001, American Ceramic Society Refractories division: A. A. Wereszczak, T. P. Kirkland, and W. F. Curtis, "Creep of CaO/SiO_2-Containing MgO Refractories," *Journal of Materials Science*, 34 215-227 (1999).
- Technical Committee Best Paper Award, ASME Turbo '96 Expo
- Best Poster Award, 18th Annual Conference on Advanced Ceramics and Composites, Cocoa Beach, FL, 1994.

PUBLICATIONS 183

PEER-REVIEWED JOURNALS 65

A. A. Wereszczak, T. G. Morrissey, C. Volante, P. Farris, Jr., R. Groele, R. H. Wiles, and H. Wang, "Thermally Conductive MgO-Filled Epoxy Molding Compounds," in review, *IEEE Transactions on Components, Packaging and Manufacturing Technology*, 2013.

J. R. Salvador, J. Y. Cho, Z. Ye, J. E. Moczygemba, A. J. Thompson, J. W. Sharp, J. D. Konig, R. Maloney, T. Thompson, J. Sakamoto, H. Wang, **A. A. Wereszczak**, and G. P. Meisner, "Thermal to Electric Energy Conversion of Skutterudite-Based Thermoelectric Modules," *Journal of Electronic Materials*, DOI: 10.1007/s1 1664-012-2261-9, October 2012.

A. A. Wereszczak, E. E Fox, M. J. Lance, and M. K. Ferber, "Failure Stress and Apparent Elastic Modulus of Diesel Particulate Filter Ceramics," SAE Int. J. Mater. Manuf, 5(2):2012, doi:10.4271/2012-01-1252.

J. J. Swab, J. C. LaSalvia, **A. A. Wereszczak**, K. T. Strong, Jr., D. Danna, M. E. Ragan, and P. J. Ritt, "Knoop Hardness - Apparent Yield Stress Relationship in Ceramics," *International Journal of Applied Ceramic Technology*, No. 3, 9:650-655 (2012).

A. A. Wereszczak, W. L. Daloz, K. T. Strong, Jr., and O. M. Jadaan, "Effect of Indenter Elastic Modulus on Hertzian Ring Crack Initiation in Silicon Carbide," *International Journal of Applied Ceramic Technology,* No. 4, 8:885-894 (2011).

O. M. Jadaan, **A. A. Wereszczak**, K. E. Johanns, and W. L. Daloz, "Weibull Effective Area for Hertzian Ring Crack Initiation Stress," *International Journal of Applied Ceramic Technology*, No. 4, 8:824-831 (2011).

J. R. Salvador, J. Yang, **A. A. Wereszczak**, H. Wang, and J. Y. Cho, "Temperature Dependent Tensile Fracture Stress of n- and p-Type Filled-Skutterudite Materials," *Science of Advanced Materials*, 3:1-10 (2011).

J. Y. Cho, X. Shi, J. R. Salvador, G. P. Meisner, J. Yang, H. Wang, **A. A. Wereszczak**, X. Zhou, and C. Uher, "Thermoelectric Properties and Investigations of Low Thermal Conductivity in Ga-Doped Cu_2GeS_3," *Physical Review B*, 84:085207 (2011).

H. Wang, H. -T. Lin, and **A. A. Wereszczak**, "Strength Properties of Poled PZT Subjected to Biaxial Flexural Loading in High Electric Field," *Journal of the American Ceramic Society*, 93:2843-2849 (2010).

H. Wang, T. A. Cooper, H. -T. Lin, and **A. A. Wereszczak**, "Fatigue Response of Lead Zirconate Titanate Stacks Under Semibipolar Electric Cycling with Mechanical Preload," *Journal of Applied Physics*, 108:084107 (2010).

M. Hadfield, W. Wang, and **A. A. Wereszczak**, "Mechanical Properties of Silicon Nitride Using RUS & C-Sphere Methodology," *Advances in Science and Technology*, 64:71-75 (2010).

W. Wang, M. Hadfield, and **A. A. Wereszczak**, "Surface Strength of Silicon Nitride in Relation to Rolling Contact Performance Measured on Ball-on-Rod and Modified Four-Ball Tests," *Tribology International*, 43:423-432 (2010).

T. J. Holmquist and **A. A. Wereszczak**, "Using Hertzian Indentation to Understand the Strength and Ballistic Resistance of Silicon Carbide," *International Journal of Applied Ceramic Technology*, [5] 7:625-634 (2010).

A. A. Wereszczak, T. P. Kirkland, K. T. Strong, Jr., J. Campbell, J. C. LaSalvia, and H. T. Miller, "Size-Scaling of Tensile Failure Stress in Hot-Pressed SiC," *International Journal of Applied Ceramic Technology*, [5] 7:635-642 (2010).

A. A. Wereszczak, T. P. Kirkland, K. T. Strong, Jr., O. M. Jadaan, and G. A. Thompson, "Size-Scaling of Tensile Failure Stress in Boron Carbide," *Advances in Applied Ceramics*, No. 8, 109:487-492 (2010). Invited

A. A. Wereszczak, T. P. Kirkland, M. E. Ragan, K. T. Strong, Jr., and P. Patel, "Size-Scaling of Tensile Failure Stress in a Float Soda-Lime Silicate Glass," *International Journal of Applied Glass Science,* No. 2, 1:143-150 (2010).

A. A. Wereszczak, D. C. Harper, C. E. Duty, and P. Patel, "Glass Strengthening via High-Intensity Plasma-Arc Heating," *Journal of the American Ceramic Society,* No. 5, 93:1256-59 (2010).

W. Wang, M. Hadfield, and **A. A. Wereszczak**, "Surface Strength of Silicon Nitride in Relation to Rolling Contact Performance," *Ceramics International*, 35:3339-3366 (2009).

J. R. Salvador, J. Yang, X. Shi, H. Wang, and **A. A. Wereszczak**, "Transport and Mechanical Property Evaluation of $(AgSbTe_2)_{1-x}(GeTe)_x$ (x=0.80, 0.82, 0.85, 0.87 and 0.90)," *Journal of Solid State Chemistry*, 182:2088-2095 (2009).

J. R. Salvador, J. Yang, X. Shi, H. Wang, **A. A. Wereszczak**, H. Kong, and C. Uher, "Transport and Mechanical Properties of Yb-Filled Skutterudites," *Philosophical Magazine*, No. 19, 89:1517-1534 (2009).

A. A. Wereszczak, K. E. Johanns, and O. M. Jadaan, "Hertzian Ring Crack Initiation in Hot-Pressed Silicon Carbide," *Journal of the American Ceramic Society*, 92:1788-1796 (2009).

X. Nie, W. C. Chen, **A. A. Wereszczak**, and D. T. Templeton, "Effect of Loading Rate and Surface Conditions on Flexural Strength of Borosilicate Glass," *Journal of the American Ceramic Society*, 92:1287-95 (2009).

H. Wang, **A. A. Wereszczak**, and H. -T. Lin, "Fatigue Response of a PZT Multilayer Actuator under High-Field Electric Cycling with Mechanical Preload," *Journal of Applied Physics*, 105:014112 (2009).

H. Wang and **A. A. Wereszczak**, "Electric Field Effect on the Failure of Poled Lead Zirconate Titanate Under Ball-on-Ring Loading," *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, 55:2559-70 (2008).

A. A. Wereszczak, T. P. Kirkland, O. M. Jadaan, Kevin T. Strong, and G. J. Champoux, "C-Sphere Strength-Size Scaling in a Bearing-Grade Silicon Nitride," *Journal of the Korean Ceramic Society*, 45 [9] 507-11 (2008).

A. A. Wereszczak, S. F. Duffy, E. H. Baker, J. J. Swab, and G. J. Champoux, "Strength of a Ceramic Sectored Flexure Specimen," *Journal of Testing and Evaluation*, **36** [1] 17-23 (2008).

A. A. Wereszczak, O. M. Jadaan, and T. P. Kirkland, "Strength Measurement of Ceramic Spheres Using a Diametrally Compressed 'C-Sphere' Specimen," *Journal of the American Ceramic Society*, **90** 1843-1849 (2007).

A. A. Wereszczak, O. M. Jadaan, H. -T. Lin, G. J. Champoux, and D. P. Ryan, "Hoop Tensile Strength Testing of Small Diameter Ceramic Particles," *Journal of Nuclear Materials*, **361** 121-125 (2007).

C. -H. Hsueh, G. A. Thompson, O. M. Jadaan, **A. A. Wereszczak**, and P. F. Becher, "Analysis of Layer-Thickness Effects in Bilayered Dental Ceramics Subjected to Thermal Stresses and Ring-on-Ring Tests," in press, *Dental Materials*, 2006.

H. -T. Lin, T. P. Kirkland, **A. A. Wereszczak**, and M. J. Andrews, "Strength Retention of Silicon Nitride After Long-Term Oil Immersion Exposure," *Journal of Materials Science*, **41** 8313-19 (2006).

A. A. Wereszczak, H. -T. Lin, and G. A. Gilde, "The Effect of Grain Growth on Hardness in Hot-Pressed Silicon Carbide," *Journal of Materials Science*, **41** 4996-5000 (2006).

S. F. Duffy, E. H. Baker, **A. A. Wereszczak**, J. J. Swab, "Weibull Analysis Effective Volume and Effective Area for a Ceramic C-Ring Test Specimen," *Journal of Testing and Evaluation*, **33** 233-238 (2005).

C. H. Hsueh and **A. A. Wereszczak**, "Multiple Cracking of Brittle Coatings on Strained Substrates," *Journal of Applied Physics*, **96** 3501-3506 (2004).

M. P. Bakas, V. A. Greenhut, D. E. Niesz, G. D. Quinn, J. W. McCauley, **A. A. Wereszczak**, and J. J. Swab, "Anomolous Defects and Dynamic Failure of Armor Ceramics," *International Journal of Applied Ceramic Technology,* **1** 211-218 (2004).

T. Jiao, Y. Li, K. T. Ramesh, and **A. A. Wereszczak**, "High Rate Response and Dynamic Failure of Structural Ceramics," *International Journal of Applied Ceramic Technology,* **1** 243-253 (2004).

J. S. Marte, S. L. Kampe, and **A. A. Wereszczak**, "Elevated Temperature Deformation Behavior of Discontinuous-Reinforced Titanium Aluminide Matrix Composites" *Materials Science and Engineering A, Structural Materials*, **346** 292-301 (2003).

J. G. Hemrick, C. W. Kistler, Jr., **A. A. Wereszczak**, and M. K. Ferber, "Thermal Conductivity of Alumina Measured with Three Techniques," *Journal of Testing and Evaluation*, **31** 438-442 (2003).

A. A. Wereszczak, H. -T. Lin, T. P. Kirkland, M. J. Andrews, and S. K. Lee, "Strength and Dynamic Fatigue of Silicon Nitride at Intermediate Temperatures," *Journal of Materials Science,* **37** 1-16 (2002).

A. A. Wereszczak, K. Breder, M. K. Ferber, T. P. Kirkland, A. Payzant, C. Rawn, E. Krug, C. L. LaRocco, R. A. Pietras, and M. Karakus, "Dimensional Changes and Creep of Silica Core Ceramics Used in Investment Casting of Superalloys," *Journal of Materials Scienc*e, **37** 4235-45 (2002).

K. Yoshimi, M. H. Yoo, **A. A. Wereszczak**, S. M. Borowicz, E. P. George, and R. H. Zee, "Yielding and Flow Behavior of Mo_5Si_3 Single Crystals," *Scripta Materialia*, **45** 1321-1326 (2001).

K. Kleveland, **A. A. Wereszczak**, T. P. Kirkland, M. -A. Einarsrud, and T Grande, "Compressive Creep Performance of $SrFeO_3$," *Journal of the American Ceramic Society,* **84** 1822-26 (2001).

M. C. Abernathy, R. A. Mirsham, A. Raman, B.Q. Li, and **A. A. Wereszczak**, "Simulation of the Flow Strength and Microstructure of Titanium Aluminide in Hot Forging," *Journal of Materials Science*, **36** 5697-5704 (2001).

A. A. Wereszczak, H. Wang, M. Karakus, W. Curtis, V. Aume, and D. VerDow, "Postmortem Analyses of Salvaged Conventional Silica Bricks From Glass Production Furnaces," *Glass Science and Technology (Glastech. Ber. Glass Sci. Technol.)*, **73** 165-174 (2000).

D. A. Woodford, **A. A. Wereszczak**, and W. T. Bakker, "Stress Relaxation Testing as a Basis for Creep Analysis and Design of Silicon Nitride," *Journal of Engineering for Gas Turbines and Power, Transactions of the ASME*, **122** [2] 206-211 (2000).

M. K. Ferber, **A. A. Wereszczak**, M. Lance, J. A. Haynes, and M. Arana Antelo, "Application of Infrared Imaging to the Study of Controlled Failure of Thermal Barrier Coatings," *Journal of Materials Science*, **35** 2643-2651 (2000).

A. A. Wereszczak, A. S. Barnes, and K. Breder, "Probabilistic Strength of {111} n-Type Silicon," *Journal of Materials Science: Materials in Electronics*, **11** 291-303 (2000).

A. A. Wereszczak, T. P. Kirkland, K. Breder, H. -T. Lin, and M. J. Andrews, "Biaxial Strength, Strength-Size-Scaling, and Fatigue Resistance of Alumina and Aluminum Nitride Substrates," *International Journal of Microcircuits and Electronic Packaging*, **22** [4] 446-458 (1999).

A. A. Wereszczak, R. A. Scheidt, M. K. Ferber, and K. Breder, "Probabilistic Thermal Shock Strength Testing Using Infrared Imaging," *Journal of the American Ceramic Society*, **82** 3605-3608 (1999).

M. G. Fahrman, **A. A. Wereszczak**, and T. P. Kirkland, "Stress Relaxation Behavior and Dimensional Stability of INCONEL™ Alloy 783," *Materials Science and Engineering*, **A271** 122-127 (1999).

A. A. Wereszczak, T. P. Kirkland, and W. F. Curtis, "Creep of CaO/SiO_2-Containing MgO Refractories," *Journal of Materials Science*, **34** 215-227 (1999).

A. A. Wereszczak, M. K. Ferber, T. P. Kirkland, A. S. Barnes, E. L. Frome, and M. N. Menon, "Asymmetric Tensile and Compressive Creep Deformation of Hot-Isostatically-Pressed Y_2O_3-Doped Si_3N_4," *Journal of the European Ceramic Society*, **19** 227-237 (1999).

A. A. Wereszczak, T. P. Kirkland, M. K. Ferber, T. R. Watkins, and R. L. Yeckley, "The Effects of Residual a Phase on the Creep Performance at 1370°C of Yttria-Doped HIPed Silicon Nitride," *Journal of Materials Science,* **33** 2053-2060 (1998).

A. A. Wereszczak, A. Parvizi-Majidi, and M. K. Ferber, "Directional Dependence of Fracture Toughness in Hot-Pressed SiC-Whisker Reinforced Alumina at Room and Elevated Temperatures," *Journal of Composite Materials,* **31** [19] 1905-1920 (1997).

A. A. Wereszczak, and T. P. Kirkland, "Creep Performance of Candidate Si_3N_4 and SiC Materials for Land-Based, Gas Turbine Engine Components," *Journal of Engineering for Gas Turbines and Power, Transactions of the ASME*, **119** [10] 799-806 (1997).

A. A. Wereszczak, T. P. Kirkland, and M. K. Ferber, "Reverse Cyclic Fatigue of a HIPed Silicon Nitride at 1370°C," *Journal of Materials Science*, **31** 6541-6553 (1996).

A. A. Wereszczak, E. Liu, V. Heng, T. P. Kirkland, and M. K. Ferber, "High Temperature Compressive Strength of Non-Oxide Ceramic Foams," *Materials Science and Engineering*, **A219/1-2** 224-228 (1996).

A. A. Wereszczak, M. K. Ferber, T. P. Kirkland, and C. -K. J. Lin, "Effect of Cyclic Loading on the Creep Performance of Silicon Nitride," *Journal of Engineering for Gas Turbines and Power, Transactions of the ASME*, **118** [2] 251-56 (1996).

A. A. Wereszczak, M. K. Ferber, T. P. Kirkland, M. R. Foley, and R. L. Yeckley, "Evolution of Stress Failure Resulting From High Temperature Stress-Corrosion Cracking in a Hot Isostatically Pressed Silicon Nitride at Elevated Temperatures," *Journal of the American Ceramic Society*, **78** [8] 2129-40 (1995).

A. A. Wereszczak, M. K. Ferber, Breder, K., T. P. Kirkland, and P. Khandelwal, "High Temperature Dynamic Fatigue Performance of a Hot Isostatically Pressed Silicon Nitride," *Materials Science and Engineering*, **A191** 257-266 (1995).

S. Raghuraman, J. F. Stubbins, M. K. Ferber, and **A. A. Wereszczak**, "Crack Propagation in SiC_f/SiC Matrix Composite Under Static and Cyclic Loading Conditions," *Journal of Nuclear Materials,* **212-215** 840-844 (1994).

A. A. Wereszczak, T. P. Kirkland, and M. K. Ferber, "Stress and Strain Relaxation Behaviour in HIPed Silicon Nitrides," *Journal of Materials Science Letters*, **13** 1469-71 (1994).

A. A. Wereszczak, K. Breder, and M. K. Ferber, "Role of Oxidation in the Time-Dependent Failure Behavior of HIPed Silicon Nitride at 1370°C," *Journal of the American Ceramic Society*, **76** [11] 2919-22 (1993).

A. A. Wereszczak, A. Parvizi-Majidi, K. L. More, and M. K. Ferber, "High Resolution Electron Microscopy of SiC_w/Al_2O_3 Composite Interfaces in Specimens Subjected to Elevated Temperatures," *Journal of the American Ceramic Society*, **76** [9] 2397-400 (1993).

M. K. Ferber, **A. A. Wereszczak**, D. H. Hansen, and J. Homeny, "Evaluation of the Interfacial Mechanical Properties in SiC Fiber-Reinforced MDF Cement Composites," *Composites Science and Technology*, **49** 23-33 (1993).

C. -H. Hsueh, M. K. Ferber, and **A. A. Wereszczak**, "The Relative Residual Fiber Displacement After Indentation Loading and Unloading of Fiber-Reinforced Ceramic Composites," *Journal of Materials Science*, **28** 2227-2232 (1993).

REFEREED CONFERENCE PROCEEDINGS *74*

A. A. Wereszczak, T. G. Morrissey, M. K. Ferber, K. P. Bortle, E. A. Rodgers, G. Tsoi, J. M. Montgomery, Y. Vohra, and S. Toller, "Responses of Siliceous Materials to High Pressure," in press, *Ceramic Engineering and Science Proceedings*, 2013.

A. A. Wereszczak, D. J. Vuono, K. P. Bortle, P. J. Ritt, J. J. Swab, and J. Campbell, "Tensile Failure Stress Anisotropy in Hot-Pressed Silicon Carbide," in press, *Ceramic Engineering and Science Proceedings*, 2013.

A. Williams, J. Burton, R. L. McCormick, T. Toops, **A. A. Wereszczak**, E. E. Fox, M. J. Lance, G. Cavataio, D. Dobson, J. Warner, R. Brezny, K. Nguyen, and D. W. Brookshear, "Impact of Fuel Metal Impurities on the Durability of a Light-Duty Diesel Aftertreatment System," Paper No. 2013-01-0513, SAE World Congress, Apr. 2013.

H. S. Lee, T. McDonald, L. Marlino, G. Eesley, C. Berlin, E. Gerbsch, A. Neelakantan, M. Briere, N. Thapar, K. Linthicum, M. Brodsley, D. Bull, C. Britton, **A. Wereszczak,** Z. Liang, and M. Chinthavali, "GaN on Silicon-based Power Switch in a Sintered, Dual-side Cooled Package," *Power Electronics Technology,* pp. 35-38, January, 2013.

T. G. Morrissey, E. E. Fox, **A. A. Wereszczak**, and D. J. Vuono, "Low Velocity Sphere Impact of Soda Lime Silicate Glass," Paper 05-07, Issue 5, Vol. 33, *Ceramic Enginering and Science Proceedings*, 2012.

E. E. Fox, **A. A. Wereszczak**, M. J. Lance, and M. K. Ferber, "Failure and Stiffness Analysis of Ceramic From a 25-mm Diameter Diesel Particulate Filter," Paper 06-17, Issue 6, Vol. 33, *Ceramic Enginering and Science Proceedings*, 2012.

A. A. Wereszczak, D. J. Vuono, Z. Liang, and E. E. Fox, "Sintered Silver Joint Strength Dependence on Substrate Topography and Attachment Pad Geometry," 7th International Conference on Integrated Power Electronics Systems (CIPS), Nuremberg, Germany, Mar. 2012.

A. A. Wereszczak, E. E. Fox, M. J. Lance, and M. K. Ferber, "Failure Stress and Apparent Elastic Modulus of Diesel Particulate Filter Ceramics," Paper No. 12PFL-0753, SAE World Congress, Apr. 2012.

M. J. Vick, O. M. Jadaan, **A. A. Wereszczak**, S. R. Choi, A. L. Heyes, K. R. Pullen, "Engine Design Strategies to Maximize Ceramic Turbine Life and Reliability, GT2011-46784, presented at ASME Turbo Expo 2011, June 6-10, 2011, Vancouver, BC, Canada.

M. Hadfield, W. Wang, and **A. Wereszczak,** "Mechanical Properties of Silicon Nitride Using RUS & C-Sphere Methodology," CIMTEC, 2010.

A. A. Wereszczak, O. M. Jadaan, and T. P. Kirkland, "Edges and Failure Stress of Si and SiC Semiconductor Chips," *Proceedings of the IMAPS HiTEC 2010*, Albuquerque, NM, 2010.

A. A. Wereszczak, M. E. Ragan, K. T. Strong, Jr., P. J. Ritt, H. Wang, J. R. Salvador, and J. Yang, Strength of N- and P-Type Skutterudites," *Ceramic Enginering and Science Proceedings*, **31**, [9] 49-60 (2010).

A. A. Wereszczak, T. P. Kirkland, O. M. Jadaan, and H. Wang, "Strength of Bismuth Telluride," *Ceramic Engineering and Science Proceedings*, **30**, [9] 131-142 (2009).

K. T. Strong, Jr., **A. A. Wereszczak**, W. L. Daloz, and O. M. Jadaan, "Indenter Elastic Modulus and Hertzian Ring Crack Initiation," *Ceramic Engineering and Science Proceedings*, **30**, [5] 83-90 (2009).

H. Wang, H. -T. Lin, **A. A. Wereszczak**, and T. A. Cooper, "Mechanical Strain and Piezoelectric Properties of PZT Stacks Related to Semi-Bipolar Electric Cycling Fatigue," *Ceramic Engineering and Science Proceedings*, **30**, [9] 67-78 (2009).

W. L. Daloz, **A. A. Wereszczak**, and O. M. Jadaan, "Apparent Yield Strength of Hot-Pressed SiCs," *Ceramic Engineering and Science Proceedings*, **29**, [6], 107-118 (2008).

O. M. Jadaan and **A. A. Wereszczak**, "Probabilistic Design Optimization and Reliability Assessment of High Temperature Thermoelectric Devices," *Ceramic Engineering and Science Proceedings*, **29**, [3], 157-172 (2008).

W. Wang, **A. Wereszczak**, and M. Hadfield, "C-Sphere Flexure Strength of Silicon Nitride in Relation to Its Rolling Contact Performance," in press, Contact/Surface 2007, 16-18 May, 2007, The New Forest, UK.

T. J. Holmquist and **A. A. Wereszczak**, "Laser Induced Spall in Silicon Carbide," 23rd International Symposium on Ballistics, Tarragona, Spain, 16-20 April, 2007.

H. Wang and **A. A. Wereszczak**, "Effects of Electric Field on the Biaxial Strength of Poled PZT," *Ceramic Engineering and Science Proceedings*, **28**, [8], 57-67 (2007).

A. A. Wereszczak, K. E. Johanns, T. P. Kirkland, C. E. Anderson, Jr., T. Behner, P. Patel, and D. Templeton, "Strength and Contact Damage Responses in a Soda-Lime-Silicate and a Borosilicate Glass," Paper FP-05, 25th Army Science Conference, Orlando, FL, Nov. 27-30, 2006.

H. Wang, H. -T. Lin, and **A. A. Wereszczak**, "Specific Energy and Scratch Hardness of Gamma Titanium Aluminides Subjected to Single-Grit Pendulum Scratching," ASME Internal Combustion Engine Division Fall Technical Conference, Sacramento, CA., Nov. 5-8, 2006.

A. A. Wereszczak and K. E. Johanns, "Spherical Indentation of SiC," *Ceramic Engineering and Science Proceedings*, **27**, [7], 43-57 (2006).

J. J. Swab, **A. A. Wereszczak**, J. Pritchett, and K. Johanns, "Influence of Microstructure on the Indentation-Induced Damage in Silicon Carbide," *Ceramic Engineering and Science Proceedings*, **27**, [7], 251-59 (2006).

A. A. Wereszczak, W. Wang, O. M. Jadaan, T. P. Kirkland, M. J. Lance, and H. -T. Lin, "Strength of a C-Sphere Flexure Specimen," *Ceramic Engineering and Science Proceedings*, **27**, [2], 281-293 (2006).

H. Wang and **A. A. Wereszczak**, "Effect of Grain Size on Dynamic Scratch Response in Alumina," *Ceramic Engineering and Science Proceedings*, **27**, [2], 767-79 (2006).

A. A. Wereszczak, "Elastic Property Determination of WC Spheres and Estimation of Compressive Loads and Impact Velocities That Initiate Their Yielding and Cracking," *Ceramic Engineering and Science Proceedings* , **27**, [7], 211-223 (2006).

A. A. Wereszczak and T. P. Kirkland, "Exclusivity of Strength-Limiting Extrinsic Surface and Hybrid Flaws," *Ceramic Engineering and Science Proceedings* , **27**, [2], 593-601 (2006).

H. Wang and **A. A. Wereszczak**, "Mechanical Responses of Silicon Nitrides Under Dynamic Indentation," *Ceramic Engineering and Science Proceedings,* **26** 275-283, (2005).

G. Subhash, M. A. Marszalek, **A. A. Wereszczak**, and M. J. Lance, "Evaluation of Scratch Resistance and Residual Stresses in Machined Silicon Nitride," *Ceramic Engineering and Science Proceedings,* **26** 285-292 (2005).

A. A. Wereszczak, R. H. Kraft, and J. J. Swab, "Flexural and Torsional Resonances of Ceramic Tiles via Impulse Excitation of Vibration," *Ceramic Engineering and Science Proceedings*, **24** 207-13 (2003).

A. A. Wereszczak, R. J. Caspe, J. J. Swab, S. F. Duffy, and E. H. Baker, "C-Ring Strength of Advanced Monolithic Ceramics," *Ceramic Engineering and Science Proceedings*, **24** 483-90 (2003).

A. A. Wereszczak and R. H. Kraft, "Instrumented Hertzian Indentation of Armor Ceramics," *Ceramic Engineering and Science Proceedings*, **23** 53-64 (2002).

J. G. Hemrick and **A. A. Wereszczak**, "Creep Measurement and Analysis of Refractories," *Fundamentals of Refractory Technology,* **125** 171-93 (2001).

C. P. R. Hoppel, S. R. Ghiorse, J. C. LaSalvia, **A. A. Wereszczak**, and B. K. Fink, "Ballistic Comparison and Mass Effectiveness for Four Ceramic/Composite Target Combinations Against Heavy Machine Gun Projectiles," in press, *Proceedings of the 12th U.S. Army Ground Vehicle Survivability Symposium*, March 26-29, 2001, Monterey, CA.

S. K. Lee, P. H. McCluskey, M. J. Readey, H. -T. Lin, and **A. A. Wereszczak**, "Silicon Nitride Ceramics for Valve Train Applications in Advanced Diesel Engines," *Ceramic Engineering and Science Proceedings*, **22** 65-73 (2001).

M. J. Andrews, **A. A. Wereszczak**, K. Breder, and T. P. Kirkland, "Fractographic Analyses Applied to Ceramic Component Life Prediction," pp. 301-315 in *Fractography of Glasses and Ceramics IV, Ceramic Transactions, Vol. 122*, J.R. Varner and G.D. Quinn, eds., American Ceramic Society, Westerville, OH, (2001).

M. J. Andrews, **A. A. Wereszczak**, K. Breder, and T. P. Kirkland, "Failure Mechanism Transformation Due to Temperature and Loading Rate," pp. 403-415 in *Fractography of Glasses and Ceramics IV, Ceramic Transactions, Vol. 122*, J.R. Varner and G.D. Quinn, eds., American Ceramic Society, Westerville, OH, (2001).

J. J. Swab, G. Gilde, P. J. Patel, **A. A. Wereszczak**, J. McCauley, and J. D. Risner, "Fracture Analysis of Transparent Armor Ceramics," pp. 489–508 in *Fractography of Glasses and Ceramics IV, Ceramic Transactions, Vol. 122*, J.R. Varner and G.D. Quinn, eds., American Ceramic Society, Westerville, OH, (2001).

A. A. Wereszczak, L. Riester, J. W. Hill, and S. Cygan, "Mechanical and Thermal Properties of Power Electronic Ceramic Multilayer Capacitors," pp. 311-322 in *Dielectric Materials and Devices*, Eds. K. M. Nair, A. S. Bhalla, T. K. Gupta, S. Hirano, B. V. Hiremath, J. Jean, and R. Pohanka, American Ceramic Society, Westerville, OH, 2001.

A. A. Wereszczak, T. P. Kirkland, and H. -T. Lin, and S. K. Lee, "Intermediate Temperature Inert Strength and Dynamic Fatigue of Candidate Silicon Nitrides for Diesel Exhaust Valves," *Ceramic Engineering and Science Proceedings*, **21** 497-508 (2000).

A. A. Wereszczak, K. Breder, L. Riester, T. P. Kirkland, and R. J. Bridge, "In-Situ Mechanical Property Evaluation of Dielectric Ceramics in Multilayer Capacitors," SAE Paper No. 00FCC-116, SAE 2000 World Congress, Arlington, VA, Apr. 2000.

H. Wang and **A. Wereszczak**, "Thermal Conductivity of Refractory Materials Used in the Glass Production Industry", *Thermal Conductivity 25*, Ed. Uher and Morelli, Technomic Publishing Co. Inc., Lancaster, PA, 350-357 (2000)

A. A. Wereszczak, M. K. Ferber, A. S. Barnes, and T. P. Kirkland, "Specimen Size Effect on the Creep of Si_3N_4," *Ceramic Engineering and Science Proceedings*, Vol. 20, pp. 535-544, 1999.

M. J. Andrews, **A. A. Wereszczak**, and K. Breder, "Prediction of the Inert Strength Distribution of Si_3N_4 Diesel Valves" *Ceramic Engineering and Science Proceedings*, Vol. 20, pp. 555-563, 1999.

K. Breder, **A. A. Wereszczak**, L. Riester, and T. P. Kirkland "Determination of Strength for Reliability Analysis of Multilayer Ceramic Capacitors" *Ceramic Engineering and Science Proceedings*, Vol. 20, pp. 565-572, 1999.

D. A. Woodford, **A. A. Wereszczak**, and W. T. Bakker, "Stress Relaxation Testing as a Basis for Creep Analysis and Design of Silicon Nitride," ASME Paper No. 99-GT-291, Presented at International Gas Turbine and Aeroengine Congress and Exhibition, Indianapolis, IN, June 7–10, 1999.

A. A. Wereszczak, K. Breder, M. K. Ferber, R. J. Bridge, L. Riester, and T. P. Kirkland, "Failure Probability Prediction of Dielectric Ceramics in Multilayer Capacitors," *Multilayer Electronic Ceramic Devices, Ceramic Transactions, Vol. 97*, pp. 73-83, 1999.

K. Breder, **A. A. Wereszczak**, and M. J. Andrews, "Exploration of the Weibull Modulus as a Function of Surface Preparation and Flexure Testing Conditions," *Ceramic Engineering and Science Proceedings*, Vol. 19, pp. 89-97, 1998.

M. J. Andrews, **A. A. Wereszczak**, K. Breder, T. P. Kirkland, and M. K. Ferber, "Investigations of the Weibull Modulus as a Function of Stressing Rate," *Ceramic Engineering and Science Proceedings*, Vol. 19, pp. 79-87, 1998.

A. A. Wereszczak, K. Breder, M. J. Andrews, T. P. Kirkland, and M. K. Ferber, "Strength Distribution Changes in a Silicon Nitride as a Function of Stressing Rate and Temperature," ASME Paper No. 98-GT-527, Presented at International Gas Turbine and Aeroengine Congress and Exhibition, Stockholm, Sweden, June 2-5, 1998.

A. A. Wereszczak, J. G. Hemrick, T. P. Kirkland, J. A. Haynes, T. J. Fitzgerald, and J. E. Junkin, "Stress Relaxation of MCrAlY Bond Coat Alloys as a Function of Temperature and Strain," ASME Paper No.98-GT-403, Presented at International Gas Turbine and Aeroengine Congress and Exhibition, Stockholm, Sweden, June 2-5, 1998.

A. A. Wereszczak, J. Heide, T. P. Kirkland, G. V. Srinivasan, and S. M. Winder, "High Temperature Deformation of an AZS Refractory," *Advances in Fusion and Processing of Glass II, Ceramic Transactions,* Vol. 82, pp. 379-384, 1998.

A. A. Wereszczak, T. P. Kirkland, G. A. Pecoraro, and R. A. New, "Compressive Creep Behavior of Fusion-Cast Alumina Refractories," *Advances in Fusion and Processing of Glass II, Ceramic Transactions,* Vol. 82, pp. 401-406, 1998.

A. A. Wereszczak, T. P. Kirkland, and W. F. Curtis, "Compressive Creep Resistance of Magnesia Refractories at Temperatures ≥ 1400°C (2550°F)," *Advances in Fusion and Processing of Glass II, Ceramic Transactions,* Vol. 82, pp. 407-412, 1998.

A. A. Wereszczak, T. P. Kirkland, H. -T. Lin, M. K. Ferber, C. -W. Li, and J. A. Goldacker, "Tensile Creep Performance of a Developmental, In-Situ Reinforced Silicon Nitride," *Ceramic Engineering and Science Proceedings*, Vol. 18, pp. 45-55, 1997.

A. A. Wereszczak, T. P. Kirkland, M. K. Ferber, J. M. Corum, and A. Peralta, "Failure Probability Prediction of Fast-Fractured NT451 SiAlON Diesel Exhaust Valves," Paper No. 97-GT-318, Presented at International Gas Turbine and Aeroengine Congress and Exhibition, Orlando, FL, June 2-5, 1997.

A. A. Wereszczak, T. P. Kirkland, M. K. Ferber, and M. J. Andrews, "Prediction of SiAlON Diesel Valve Failure Probability Using AlliedSignal's *CERAMIC* and *ERICA* Life Prediction Codes," *Ceramic Engineering and Science Proceedings*, Vol. 18, pp. 475-484, 1997.

M. N. Ghasemi-Nejhad, M. V. Chandramouli, and **A. A. Wereszczak**, "Processing and Performance of SiC/BlackGlas™ CFCCs Using Filament Winding," *Ceramic Engineering and Science Proceedings*, Vol. 17, No. 4, pp. 449-458, 1996.

S. Raghuraman, J. F. Stubbins, M. K. Ferber, and **A. A. Wereszczak**, "Stress-Oxidation Tests in SiC_f/SiC Composites," pp. 1015-1026 in *Advances in Ceramic-Matrix Composites, II*, 1996.

G. V. Srinivisan, J. Gibson, S. K. Lau, **A. A. Wereszczak**, and M. K. Ferber, "The Origin of Strength Limiting Defects in a Toughened SiC (Hexaloy SX-SiC)," pp. 181-92 in *Fractography of Glasses and Ceramics, III*, July 9-12, 1995, NY State College of Ceramics, Alfred University, Alfred, NY.

K. Breder, **A. A. Wereszczak**, V. J. Tennery, and T. J. Mroz, "Utilization of Fractography in the Evaluation of High-Temperature Dynamic Fatigue Experiments," pp. 353-66 in *Fractography of Glasses and Ceramics, III*, July 9-12, 1995, NY State College of Ceramics, Alfred University, Alfred, NY.

A. A. Wereszczak, T. P. Kirkland, and M. K. Ferber, "Differences in Creep Performance of a HIPed Silicon Nitride in Ambient Air and Inert Environments," *Ceramic Engineering and Science Proceedings*, Vol. 16, No. 5, pp. 901-909, 1995.

A. A. Wereszczak, M. K. Ferber, T. P. Kirkland, and K. L. More, "Evolution of Oxidation and Creep Damage Mechanisms in HIPed Silicon Nitride Materials," pp. 457-66 in *Plastic Deformation of Ceramics*, eds. R. C. Bradt, C. A. Brookes, and J. L. Routbort, Plenum Press, New York, 1995.

A. A. Wereszczak, M. K. Ferber, T. P. Kirkland, E. Lara-Curzio, V. Parthasarthy, and T. T. Gribb, "Stress Relaxation of Silicon Nitride at Elevated Temperatures," *Ceramic Engineering and Science Proceedings*, Vol. 16, No. 4, pp. 519-528, 1995.

C. N. Ruiz, S. S. Mysore, L. A. Jackman, R. B. Lal, and **A. A. Wereszczak**, "Creep Behavior of Fine Grain, Low Carbon Allvac 718," pp. 523-534 in *Superalloys 718, 625, 706 and Derivatives*, Pittsburgh, PA, June, 1994.

S. Raghuraman, J. F. Stubbins, M. K. Ferber, and **A. A. Wereszczak**, "Crack Growth Behavior of SiC_f/SiC Composites at Room and High Temperatures," *Ceramic Engineering and Science Proceedings*, Vol. 15, No. 7-10, pp. 827-834, 1994.

A. A. Wereszczak, M. K. Ferber, and T. P. Kirkland, "Effects of Oxidation and Creep Damage Mechanisms on Creep Behavior in HIPed Silicon Nitrides," *Ceramic Engineering and Science Proceedings*, Vol. 15, No. 7-10, pp. 49-56, 1994.

M. G. Jenkins, J. P. Piccola, Jr., M. Mello, E. Lara-Curzio, and **A. A. Wereszczak**, "Ambient- and Elevated-Temperature Mechanical Behaviour of a 3-D Braided, Continuous SiC Fibre-Reinforced/CVI SiC Matrix Composite," *Ceramic Engineering and Science Proceedings*, Vol. 15, No. 7-10, pp. 209-218, 1994.

M. K. Ferber, **A. A. Wereszczak**, L. Riester, R. A. Lowden, and K. K. Chawla, "Evaluation of the Interfacial Mechanical Properties in Fiber-Reinforced Ceramic Composites," *Ceramic Engineering and Science Proceedings*, Vol. 14, No. 7-10, pp. 168-179, 1993.

A. A. Wereszczak, M. K. Ferber, and R. A. Lowden, "Development of an Interfacial Test System for the Determination of Interfacial Properties in Fiber Reinforced Ceramic Composites," *Ceramic Engineering and Science Proceedings*, Vol. 14, No. 7-10, pp. 156-167, 1993.

A. A. Wereszczak, M. K. Ferber, R. R. Sanders, M. G. Jenkins, and P. Khandelwal, "Fracture Toughness (K_{Ic} and g_{wof}) of a HIPed Si_3N_4 at Elevated Temperatures," *Ceramic Engineering and Science Proceedings*, Vol. 14, No. 7-10, pp. 101-112, 1993.

A. A. Wereszczak and A. Parvizi-Majidi, "Alumina Short Fiber Reinforced Cordierite Model Composites for the Study of Interphase Effect on Toughness," pp. 77-94 in *Processing and Fabrication of Advanced Materials for High Temperature Applications*, Eds. V. A. Ravi and T. S. Srivatsan, The Minerals, Metals & Materials Society, Warrendale, PA, 1992.

A. A. Wereszczak and A. Parvizi-Majidi, "Effect of Fracture Temperature and Relative Crack Propagation Rate on the Fracture Behavior of Whisker Reinforced Ceramic Matrix Composites," In *Ceramic Engineering and Science Proceedings*, Vol. 11, No. 7-10, pp. 721-733, 1990.

OTHERS ***11***

J. G. Hemrick and **A. A. Wereszczak**, "Non-Classical Creep Behavior of Fusion-Cast α/β Alumina Refractories," Refractory Applications Transactions, Vol. 4, No. 1 (2009).

J. G. Hemrick, R. E. Moore, **A. A. Wereszczak**, and M. K. Ferber, "Creep Behavior and Physical Characterization of Fusion-Cast Alumina Refractories (Part I-III)", Refractories Applications and News, Vol. 6, No. 2-4, (2001).

J. G. Hemrick and **A. A. Wereszczak**, "Compressive Creep of Fusion-Cast Alumina as a Function of Microstructure," *Glass Industry*, pp. 9-10 & 13, November, 1999.

J. G. Hemrick and **A. A. Wereszczak**, "Characterization of Conventional Silica Refractories Used in Glass Furnace Superstructures," *Glass Industry*, pp. 15-18, June, 1999.

A. A. Wereszczak, "Which Superstructure Refractories Do Glassmakers Desire Creep Data For?," *Glass Industry*, pp. 17-18, 24, November, 1998.

A. A. Wereszczak, J. D. Smith, and R. E. Moore, "Probabilistic Life Design of Refractories for Steel Casting," *Proceedings of the 34th Annual Symposium on Refractories*, Univ. of Missouri-Rolla, 1998. (Invited)

A. A. Wereszczak, "Creep of Melter Crown and Regenerator Refractories," pp. 19-20, 22 in *The GlassResearcher Bulletin of Glass Science and Engineering*, New York State College of Ceramics at Alfred University, Vol. 7, No. 2, Winter, 1998. (Invited)

M. N. Ghasemi-Nejhad, M. V. Chandramouli, and **A. A. Wereszczak**, "Processing and Performance of Continuous Fiber Ceramic Composites by Filament Winding and Pre-Ceramic Polymer Pyrolysis," pp 161-162 in Mechanical Behavior Proceedings of the 1996 ASME International Mechanical Engineering Congress and Exposition, Atlanta, GA, 1996.

A. A. Wereszczak, M. K. Ferber, and T. P. Kirkland, "Life-Prediction Verification," pp. 4-5 in *Ceramic Technology Newsletter*, Winter 1995, Oak Ridge National Laboratory, Office of Transportation Technologies, U. S. Department of Energy. (Invited)

A. A. Wereszczak, K. Breder, M. K. Ferber, T. P. Kirkland, and P. Khandelwal, "Environmental Effects on the Flexure Strength of HIPed Silicon Nitride at Elevated Temperatures," pp. 686-7 in *Extended Abstracts, Vol. 93-2, Fall Meeting of the Electrochemical Society*, Electrochemical Society, Pennington, NJ., 1993.

A. A. Wereszczak, "Toughening Mechanisms in Whisker/Short Fiber Reinforced Ceramic Composites at Elevated Temperatures", Ph.D. Thesis, University of Delaware, Newark, DE, August 1992.

BOOK CHAPTERS ***4***

A. A. Wereszczak and E. Case, *Mechanical Response of Thermoelectric Materials*, in preparation, 2013.

S. F. Duffy, L. A. Janosik, **A. A. Wereszczak**, B. Schenk, A. Suzuki, J. Lamon, and D. Thomas, *Life Prediction of Structural Components*, Chapter 25 in Ceramic Gas Turbine Component Development and Characterization: Progress in Ceramic Gas Turbine Development, Vol. 2, M. van Roode, M. K. Ferber, and D. W. Richerson, Edts., ASME Press, New York, 2003.

M. K. Ferber, M. G. Jenkins, and **A. A. Wereszczak**, *Fracture Strength*, Mechanical Testing Methodology for Ceramic Design and Reliability, D. Cranmer and D. Richerson, Edts., Marcel Dekker, Inc., 1998.

K. Breder and **A. A. Wereszczak**, *Fatigue and Slow Crack Growth*, Mechanical Testing Methodology for Ceramic Design and Reliability, D. Cranmer and D. Richerson, Edts., Marcel Dekker, Inc., 1998.

REPORTS ***29***

ORNL/TM-2013/60 Report: "Design and Development of an Asynchronous Traction Motor to Meet DOE 2020 Targets," J. Miller, C. Ayers, **A. Wereszczak**, B. Ozpineci, and R. Wiles, March, 2013.

ORNL/TM-2013/4 Report: "High Pressure Response of Silica," **A. A. Wereszczak**, T. G. Morrissey, M. K. Ferber, K. P. Bortle, E. A. Rodgers, G. Tsoi, J. M. Montgomery, Y. K. Vohra, and S. Toller, February, 2013.

CL-12/330/CMS: "Thermoelectric and Mechanical Properties of Melt-Spun n-Type Yb- and Ba-Filled Skutterudites," J. R. Salvador, R. A. Waldo, C. A. Wong, M. Tessema, D. N. Brown, D. J. Miller, H. Wang, **A. A. Wereszczak**, and W. Cai, GM Collaborative Report, Global Research and Development, 03 Dec 2012.

ORNL/TM-2012/139 Report: "Initial Examination of Low Velocity Sphere Impact of Glass Ceramics," T. G. Morrissey, E. E. Fox, **A. A. Wereszczak,** and M. K. Ferber, June, 2012.

ORNL/TM-2012/130 Report: "Properties of Bulk Sintered Silver as a Function of Porosity," **A. A. Wereszczak**, D. J. Vuono, H. Wang, M. K. Ferber, and Z. Liang, June, 2012.

ORNL/TM-2012/99 Report: "Promoting Large Grain Formation in Thin Net-Shaped Multicrystalline Silicon Wafers," **A. A. Wereszczak**, C. E. Duty, D. J. Vuono, H. -T. Lin, G. E. Jellison, Jr., T. G. Morrissey, and J. A. Angelini, May, 2012.

ORNL/TM-2012/60 Report: "Low Velocity Sphere Impact of Borosilicate Glass," T. G. Morrissey, M. K. Ferber, **A. A. Wereszczak**, and E. E. Fox, May, 2012.

ORNL/TM-2011/259 Report: "Low Velocity Sphere Impact of a Soda Lime Silicate Glass," **A. A. Wereszczak**, E. E. Fox, T. G. Morrissey, and D. J. Vuono, October, 2011.

ORNL/TM-2010/253 Report: "Evaluation of the 2010 Toyota Prius Hybrid Synergy Drive System," T. A. Burress, S. L. Campbell, C. L. Coomer, C. W. Ayers, **A. A. Wereszczak**, J. P. Cunningham, L. D. Marlino, L. E. Sieber, and H. -T. Lin, March, 2011.

ORNL/TM-2010/233 Report: "Technical Project Plan for the Enhanced Thermal Conductivity of Oxide Fuels Through the Addition of High Thermal Conductivity Fibers and Microstructural Engineering," D. F. Hollenbach, L. J. Ott, T. M. Bessman, B. L. Armstrong, **A. A. Wereszczak**, H. -T. Lin, R. J. Ellis, P. F. Becher, R. T. Jubin, and S. L. Voit, September, 2010.

ORNL/TM-2009/234 Report: "ORNL Quasi-Static Mechanical Characterization and Analysis: FY09 Annual Report to TARDEC," **A. A. Wereszczak**, T. P. Kirkland, K. T. Strong, Jr., and T. J. Holmquist, December, 2009.

ORNL/TM-2009/133 Report: "Probabilistic Mechanical Reliability Prediction of Thermoelectric Legs," O. M. Jadaan and **A. A. Wereszczak**, May, 2009.

ORNL/TM-2009/100 Report: "Effective Size Analysis of the Diametral Compression (Brazil) Test Specimen," O. M. Jadaan and **A. A. Wereszczak**, April, 2009.

ORNL/TM-2009/090 Report: "Revisiting the Recommended Geometry for the Diametrally Compressed Ceramic C-Ring Specimen," O. M. Jadaan and **A. A. Wereszczak**, April, 2009.

ORNL/TM-2008/185 Report: "Evaluation of the 2008 Lexus LS 600H Hybrid Synergy Drive System," T. A. Burress, C. L. Coomer, S. L. Campbell, **A. A. Wereszczak**, J. P. Cunningham, L. D. Marlino, L. E. Seiber, and H. -T. Lin, January, 2009.

ORNL/TM-2008/112 Report: "Direct-Cooled Power Electronics Substrate," R. Wiles, C. Ayers, **A. A. Wereszczak**, and K. Lowe, December, 2008.

ARL-TR-4634 Report: "Microstructure and Properties of WC Spheres," J. J. Swab, J. Pritchett, **A. A. Wereszczak**, and O. M. Jadaan, November, 2008.

ORNL/TM-2006/568 Report: "Material Removal and Specific Energy in the Dynamic Scratching of Gamma Titanium Alumindes," H. Wang, H. -T. Lin, and **A. A. Wereszczak**, November, 2006.

ORNL/TM-2006/521 Report: "Rolling Contact Fatigue of Ceramics," **A. A. Wereszczak**, W. Wang, Y. Wang, M. Hadfield, W. Kanematsu, T. P. Kirkland, and O. M. Jadaan, August, 2006.

ARL-TR-3617 Report: "Effects of Machining on the Uniaxial and Equibiaxial Flexure Strength of CAP3 AD-995 Al_2O_3," **A. A. Wereszczak**, J. J. Swab, and R. H. Kraft, September 2005.

ORNL/TM-2005/134 Report: "Compressive Creep and Thermophysical Performance of Refractory Materials," M. K. Ferber, **A. A. Wereszczak**, and J. G. Hemrick, U.S. DOE Energy Efficiency and Renewable Energy, Industrial Technologies Program, June 2005.

ARL-TR-3417 Report: "Mechanical and Thermal Properties of Advanced Ceramics for Gun Barrel Applications,"J. J. Swab, **A. A. Wereszczak**, J. Tice and R. Caspe, R. Kraft, and J. W. Adams, February 2005.

ORNL/TM-2002/84 Report: "Compressive Creep and Thermophysical Performance of Mullite Refractories," J. G. Hemrick, **A. A. Wereszczak**, M. Karakus, K. C. Liu, H. Wang, B. A. Pint, T. P. Kirkland, and R. E. Moore, March, 2002.

NGIC Report FMTR-1837-2000-16-01: "Characterization of Foreign Ceramic Spheres," M. Pepi, **A. Wereszczak**, K. Cho, J. Swab, W. Green, J. McCauley, and J. Adams, July 2001.

ORNL/TM-1998/501 Report: "Addressing the Manufacturing Issues Associated with the Use of Ceramic Materials for Diesel Engine Components," S. B. McSpadden, Jr., R. D. Ott, T. R. Watkins, **A. A. Wereszczak**, C. R. Brinkman, M. Andrews, B. Fix, and J. Thiele, U.S. DOE Office of Transporation Technologies, July 2001.

ORNL/TM-1999/332 Report: "Strength and Fatigue of NT551 Silicon Nitride and NT551 Diesel Exhaust Valves," M. J. Andrews, **A. A. Wereszczak**, T. P. Kirkland, and K. Breder, U.S. DOE Office of Transportation Technologies, February 2000.

ORNL/TM-1999/202 Report: "Toward the Assessment of Mechanical Robustness of Ceramic Multilayer Capacitors (MLCs)," **A. A. Wereszczak**, K. Breder, L. Riester, T. P. Kirkland, and R. J. Bridge, U.S. DOE Office of Transportation Technologies, October 1999.

ORNL/TM-13753 Report: "Compressive Creep Performance and High Temperature Dimensional Stability of Conventional Silica Refractories," **A. A. Wereszczak**, M. Karakus, K. C. Liu, B. A. Pint, R. E. Moore, and T. P. Kirkland, U.S. DOE Office of Industrial Technologies, March 1999.

ORNL/TM-12943 Report: "The High Temperature Mechanical Performance of a Hot Isostatically Pressed Silicon Nitride," **A. A. Wereszczak**, M. K. Ferber, and M. G. Jenkins, U.S. DOE Office of Transportation Technologies, January 1996.

PRESENTATIONS 112

"Responses of Siliceous Materials to High Pressures," *37th International Conference on Advanced Ceramics and Composites*, Daytona Beach, FL, Jan. 30, 2013.

"Tensile Failure Stress Anisotropy in Hot-Pressed Silicon Carbide," *37th International Conference on Advanced Ceramics and Composites*, Daytona Beach, FL, Jan. 30, 2013.

"Uniqueness of Mechanical Failure of Ceramics, Glasses, and Other Brittle Materials," John F. McMahon Lecture, Alfred University, Alfred, NY, Nov. 08, 2012. [Invited]

"Transparent and Ceramic Armor," 45th Combined Light Armor Survivability Panel (CLASP) Meeting, Oak Ridge, TN, May 16, 2012. [Invited]

"Failure Stress and Apparent Elastic Modulus of Diesel Particulate Filter Ceramics," SAE 2012 World Congress & Exhibition, Detroit, MI, Apr. 26, 2012.

"Sintered Silver Joint Strength Dependence on Substrate Topography and Attachment Pad Geometry," 7th International CIPS, Nuremburg, Germany, Mar. 8, 2012.

"Alternative Mechanical Test Specimens for Estimating Tensile Failure Stress and Elastic Modulus of Porous DPF Ceramics," ASTM C28 Committee Meeting, Daytona Beach, FL, Jan. 22, 2012. [Invited]

"Failure Stress and Apparent Elastic Modulus of Diesel Particulate Filter Ceramics," 17th Directions in Engine-Efficiency and Emissions Research (DEER) Conference, Detroit, MI, Oct. 04, 2011.

"Strength of n- and p-Type Skutterudite Thermoelectric Materials for High-Temperature Waste-Heat Recovery," Vanderbilt University, Nashville, TN, Apr. 04, 2011.

"Edge-Controlled Mechanical Failure of Si and SiC Semiconductor Chip," High Temperature Electronics (HiTEC 2010), Albuquerque, NM, May 13, 2010.

"Ceramic and Glass Strength-Size Scaling," *School of Aeronautics and Astronautics*, Purdue University, West Lafayette, IN, Feb. 11, 2010. [Invited]

"Strengthening of Soda-Lime Silicate Glass Using High-Intensity Plasma-Arc Heating," *34th International Conference on Advanced Ceramics and Composites*, Daytona Beach, FL, Jan. 27, 2010.

"Strength of N- and P-Type Skutterudites," *34th International Conference on Advanced Ceramics and Composites*, Daytona Beach, FL, Jan. 26, 2010.

"Strengthening of Soda-Lime Silicate Glass Using High-Intensity Plasma-Arc Heating," *Corning Glass*, Corning, NY, 21 Jul 2009.

"Flaws and Mechanical Response in Polycrystalline Armor Ceramics," *US Army TARDEC Transparent Armor Materials Working Group Meeting*, University of Mississippi, Oxford, MS, 07 May 2009.

"Quasi-Static Characterization and Analysis," *US Army TARDEC Transparent Armor Materials Working Group Meeting*, University of Mississippi, Oxford, MS, 06 May 2009.

"Hertzian Indentation of Si_3N_4 Using Si_3N_4 Balls," 5th Annual Fulrath Symposium, *2009 International Ceramics Exhibition*, Tokyo, Japan, Apr. 08, 2009. [Invited]

"Strength of Bismuth Telluride," *33rd International Conference on Advanced Ceramics and Composites*, Daytona Beach, FL, Jan. 22, 2009.

"Hertzian Indentation With Si_3N_4 Balls on a Flat Si_3N_4 Target," *33rd International Conference on Advanced Ceramics and Composites*, Daytona Beach, FL, Jan. 20, 2009.

"C-Sphere Flexure Strength of Bearing-Grade Silicon Nitride Balls," MST2008, Pittsburgh, PA, Oct. 07, 2008. [Invited]

"ORNL Characterization of Armor Ceramics in Support of the US Army TARDEC," Imperial College, London, UK, Sep. 16, 2008. [Invited]

"Hertzian Indentation of Hot-Pressed Silicon Carbide: Ring Cracking, Apparent Yielding, and Indenter Influences," International Symposium on New Frontier of Advanced Si-Based Ceramics and Composites, Jeju, Korea, 08-11 June 2008. [Invited]

"C-Sphere Strength-Size Scaling in a Bearing-Grade Silicon Nitride," International Symposium on New Frontier of Advanced Si-Based Ceramics and Composites, Jeju, Korea, 08-11 June 2008.

"Mechanical Characterization of Fuel Injector Piezoactuators and Their Piezoceramics," 13th DEER Conference, Detroit, MI, Aug. 16, 2007.

"Quasi-Static Spherical Indentation of SiC-B, SiC-N, SiC-HPN, and SiC-SC-1RN**,"** *Rutgers CCMC Armor Subcommittee Workshop*, Daytona Beach, FL, Jan. 24, 2007.

"Ring Crack Initiation in SiC**,"** *31st International Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites*, Daytona Beach, FL, Jan. 24, 2007.

"Sub-Surface Damage in Spherically Indented Alumina**,"** *31st International Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites*, Daytona Beach, FL, Jan. 24, 2007.

"Strength of a C-Sphere Flexure Specimen," *30th Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL, Jan. 24, 2006.

"Spherical Indentation of SiC," *30th Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL, Jan. 24, 2006.

"Overview of Research in ORNL's Ceramic Science and Technology Group," Vanderbilt University, Nashville, TN, Nov. 30, 2005.

"In Vivo Microstructural-Mechanical Modeling and Characterization of Environmental Barrier Coatings (EBCs)," EBC Workshop, Nashville, TN, Nov. 15, 2005.

"Research Overview of ORNL's Ceramic Science and Technology Group," University of Alabama, Tuscaloosa, AL, Apr. 20, 2005.

"Research Overview of ORNL's Ceramic Science and Technology Group," Alfred University, Alfred, NY, Feb. 10, 2005.

"Elastic Property Determination of WC Spheres and Estimation of Compressive Loads and Impact Velocities that Initiate Their Yielding and Cracking," *29th Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL, Jan. 25, 2005.

"Exclusivity of Strength-Limiting Intrinsic and Hybrid Flaws," *29th Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL, Jan. 25, 2005.

"Evaluation of Ceramic Deformation Processes Through Instrumented Hertzian Indentation," Saint-Gobain, Worcester, MA, Aug. 3, 2004.

"Evaluation of Ceramic Deformation Processes Through Instrumented Hertzian Indentation," *2004 Interagency Coordinating Committee on Structural Ceramics*, National Science Foundation, Arlington, VA, Apr. 14, 2004.

"Strength of a Sectored Flexure Specimen," *28th Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL, Jan. 27, 2004.

"Strength-Size-Scaling in Zirconia Laminates," *28th Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL, Jan. 29, 2004.

"Effect of Surface Condition on Hot-Pressed SiC Equibiaxial Flexure Strength," *105th Meeting of the American Ceramic Society*, Nashville, TN, Apr. 30, 2003.

"Flexural and Torsional Resonances of Ceramic Tiles via Impulse Excitation of Vibration," *27th Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL, Jan. 30, 2003.

"C-Ring Strength of Advanced Monolithic Ceramics," *27th Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL, Jan. 31, 2003.

"*Ceramic Gun Barrel Technology*," Report to ARL Technical Assessment Board Panel on Armor and Armaments, Aberdeen, MD, Jun. 4, 2002.

"*Hertzian Indentation Techniques on Silicon Carbide Ceramics*," US/Swedish DEA-A-SW-62-0004 Meeting, Aberdeen, MD, May 14, 2002.

"Ceramic Gun Barrel Technology," *104rd Meeting of the American Ceramic Society*, St. Louis, MO, Apr. 29, 2002.

"Instrumented Hertzian Indentation of Armor Ceramics," *Graduate Materials Engineering Seminar, Rutgers University*, Apr. 9, 2002.

"Ceramic Gun Barrel Technology," *Graduate Materials Engineering Seminar, University of Dayton Research Institute*, Jan. 31, 2002.

"Instrumented Hertzian Indentation of Armor Ceramics," *26th Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL, Jan. 17, 2002.

"Instrumented Hertzian Indentation of Armor Ceramics," *Graduate Materials Engineering Seminar, University of Delaware*, Oct. 17, 2002.

"Ceramic Gun Barrel Technology STO," *WTC Review*, Arlington, VA, May 29, 2001.

"Ceramic Gun Barrel Technology STO," *Benet Laboratories*, Watervliet Arsenal, Watervliet, NY, Apr. 9, 2001.

"Ceramic Gun Barrel Technology STO," *AMC Headquarter*s, Fairfax, VA, Mar. 16, 2001.

"Ceramic Gun Barrel Technology STO," *ARL Headquarters*, Adelphi, MD, Feb. 15, 2001.

"Creep of CaO/SiO2-Containing MgO Refractories," *103rd Meeting of the American Ceramic Society*, Indianapolis, IN, Apr. 23, 2001.

"High Strain Rate Testing of Structural Ceramics," *103rd Annual Meeting of the American Ceramic Society*, Indianapolis, IN, Apr. 24, 2001.

"Mechanical and Thermal Properties of Power Electronic Ceramic Multilayer Capacitors," *102nd Annual Meeting of The American Ceramic Society,* St. Louis, MO, May 2, 2000.

"Strength and its Dependence on Secondary Phase Softening in Silicon Nitrides," *102nd Annual Meeting of The American Ceramic Society,* St. Louis, MO, May 2, 2000.

"Creep Measurement and Analysis of Refractories," *102nd Annual Meeting of The American Ceramic Society,* St. Louis, MO, May 1, 2000.

"In-Situ Mechanical Property Evaluation of Dielectric Ceramics in Ceramic Multilayer Capacitors," 2000 Future Car Congress, Arlington, VA, Apr. 4, 2000.

"High Temperature Inert Strength and Dynamic Fatigue of Candidate Silicon Nitrides for Diesel Exhaust Valves," *24th Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL, Jan. 27, 2000.

"Microstructural Changes in Glass Tank Refractory Silica and Their Effect on Its Thermal Conductivity, *American Ceramic Society's Glass and Optical Materials Division Fall Meeting*, Cleveland, OH, Oct. 5, 1999.

"Mechanical Characterization and Reliability Analysis of Ceramic MLCs," Power Electronics Passive Components Workshop, Naval Research Laboratory, Washington, DC, Jun. 11, 1999.

"Specimen Size Effect on the Creep of Si_3N_4," *23rd Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL Jan. 28, 1999.

"Probabilistic Thermal Shock Strength Testing Using Infrared Imaging," *Corning Glass Incorporated*, Corning, NY Sep. 17, 1998.

"Life Prediction of Ceramic Valves," *Saint-Gobain/Norton Industrial Ceramic Company*, Northboro, MA Sep. 16, 1998.

"Recommended Materials Specifications for NT551 Silicon Nitride Components," *Caterpillar Technical Center*, Peoria, IL Aug. 28, 1998.

"Strength Distribution Changes in a Silicon Nitride as a Function of Stressing Rate and Temperature," *43rd ASME Gas Turbine and Aeroengine Technical Congress,* Stockholm, Sweden, Jun. 3, 1998.

"Stress Relaxation of MCrAlY Bond Coat Alloys as a Function of Temperature and Strain," *43rd ASME Gas Turbine and Aeroengine Technical Congress,* Stockholm, Sweden, Jun. 3, 1998.

"Failure Probability Prediction of AlN and Al_2O_3 Substrates," *100th Annual Meeting of The American Ceramic Society,* Cincinnati, OH May 5, 1998.

"Failure Probability Prediction of Dielectric Ceramics in Multilayer Capacitors," *100th Annual Meeting of The American Ceramic Society,* Cincinnati, OH May 4, 1998.

"Probabilistic Life Design of Refractories for Steel Casting," *34th Annual Symposium on Refractories, St. Louis Section of the American Ceramic Society*, University of Missouri-Rolla, Rolla, MO, Mar. 19, 1998.

"Life Prediction of Automotive Electronic Substrates," *Annual Automotive Technology Development Contractors' Coordination Meeting*, Dearborn, MI, Oct. 29, 1997.

"Compressive Creep Resistance of Magnesia Refractories at Temperatures ≥ 1400°C (2550°F)," *Advances in the Fusion and Processing of Glass*, Toronto, Jul. 30, 1997.

"Compressive Creep Behavior of Fusion-Cast Alumina Refractories," *Advances in the Fusion and Processing of Glass*, Toronto, Jul. 30, 1997.

"High Temperature Deformation of an AZS Refractory," *Advances in the Fusion and Processing of Glass*, Toronto, Jul. 30, 1997.

"Development of Improved Refractories," *2nd Annual OIT/AIM Program Review*, Albuquerque, NM, Jun. 18, 1997.

"Failure Probability Prediction of Fast-Fractured NT451 SiAlON Diesel Valves," *ASME Turbo Expo '97*, Orlando, FL, Jun. 4, 1997.

"Dynamic Fatigue Characteristics of Electronic Ceramic Films," *99th Annual Meeting of The American Ceramic Society*, Cincinnati, OH May 5-7, 1997.

"High Temperature Mechanical Properties and Corrosion Resistance of Refractories," *2nd Industrial Energy Efficiency Expo*, Arlington, VA, Feb. 27, 1997.

"Tensile Creep Performance of a Developmental, In-Situ Reinforced Silicon Nitride," *21st Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL Jan. 12-16, 1997.

"Prediction of SiAlON Diesel Valve Failure Probability Using AlliedSignal's *CERAMIC* and *ERICA* Life Prediction Codes," *21st Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL Jan. 12-16, 1997.

"Life Prediction and Reliability Analysis of Load-Bearing Ceramics," *Lehigh University*, Bethlehem, PA, Oct. 23, 1996.

"Compressive Creep Performance of Glass Furnace Crown Refractories," *University of Missouri-Rolla Ceramic Engineering Department Seminar Series*, Rolla, MO, Oct. 10, 1996. (Invited)

"High Temperature Deformation," a lecture given at the *University of Missouri-Rolla to the "Behavior of Materials - Mechanical" graduate-level class in their Ceramic Engineering Department*, Rolla, MO, Oct. 10, 1996. (Invited)

"Creep Rate of Fusion-Cast Refractories," *Pittsburgh Plate Glass Incorporated, Glass Technology Center Seminar Series*, Pittsburgh, PA, May 2, 1996. (Invited)

"Reliability Prediction of Thin Alumina Plates Using AlliedSignal's CERAMIC and ERICA Life Prediction Codes," *98th Annual Meeting of The American Ceramic Society*, Indianapolis, IN Apr. 14-17, 1996.

"Mechanical Performance of a Candidate SiAlON Ceramic for Diesel Engine Applications," *98th Annual Meeting of The American Ceramic Society*, Indianapolis, IN Apr. 14-17, 1996.

"Compression Creep Performance of Fusion-Cast Alumina Refractories," *98th Annual Meeting of The American Ceramic Society*, Indianapolis, IN Apr. 14-17, 1996.

"Verification of Life Prediction Methodology as Applied to a Ceramic Valve," *Annual Automotive Technology Development Contractors' Coordination Meeting*, Dearborn, MI, Oct. 26, 1995.

"Issues Pertinent to the Compression Creep Testing of Refractories," *1995 Refractory Ceramics Division Meeting*, Huron, OH, Oct. 6, 1995.

"Compression Creep Testing of Refractories at the HTML," *NSF Industry - University Center for Glass Research, Semiannual Research Meeting*, Alfred University, Alfred, NY, Jul. 26, 1995.

"Effect of Cyclic Loading on the Creep Performance of Silicon Nitride," *ASME Turbo Expo '95*, Houston, TX, Jun. 6, 1995.

"Stress Relaxation of SN88, SN253, and NCX-5102 Silicon Nitrides at 1300°C," *Graduate Materials Engineering Seminar, University of Dayton Research Institute*, Dayton, OH, Apr. 10, 1995. (Invited)

"Stress Relaxation of Silicon Nitride at Elevated Temperatures," *19th Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL Jan. 8-12, 1995.

"Differences in Creep Performance of a HIPed Silicon Nitride in Ambient Air and Inert Environments," *19th Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL Jan. 8-12, 1995.

"Creep and Oxidation Effects in Silicon Nitride," Ceramic Technology Project Quarterly Management Meeting, Washington, D.C., Sep. 8, 1994. (Invited)

"Evolution of Oxidation and Creep Damage Mechanisms in HIPed Silicon Nitride Materials," *Plastic Deformation of Ceramics*, Snowbird, UT, Aug. 10, 1994.

"Fracture Evolution in HIPed Silicon Nitride at Elevated Temperatures," *96th Annual Meeting of The American Ceramic Society*, Indianapolis, IN Apr. 25-28, 1994.

"Effects of Oxidation and Creep Damage Mechanisms on Creep Behavior in HIPed Silicon Nitrides," *18th Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL Jan. 9-14, 1994.

"The Effect of Oxidation in Yttrium Silicate Grain Boundaries in HIPed Silicon Nitride and Its Role in Dictating Creep Lifetime," NEDO Invitee Participation Program, The Mechanical Engineering Laboratory, Tsukuba, Japan, Nov. 11, 1993 and the Japan Fine Ceramics Center, Nagoya, Japan, Nov. 2, 1993. (Invited)

"Environmental Effects on the Flexure Strength of HIPed Silicon Nitride at Elevated Temperatures," *184th Meeting of the Electrochemical Society*, New Orleans, LA, Oct. 12, 1993.

"Dynamic Fatigue Behavior at a HIPed Silicon Nitride in Air and Inert Environments at 1370°C," *95th Annual Meeting of The American Ceramic Society*, Cincinnati, OH Apr. 18-22, 1993.

"Development of an Interfacial Test System for the Determination of Interfacial Properties in Fiber Reinforced Ceramic Composites," *17th Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL Jan. 10-15, 1993.

"Fracture Toughness (K_{Ic} and g_{wof}) of a HIPed Si_3N_4 at Elevated Temperatures," *17th Annual Conference on Composites and Advanced Ceramics*, Cocoa Beach, FL Jan. 10-15, 1993.

"Fracture Toughness of a SiC_w/Al_2O_3 Composite at Elevated Temperatures," *Third HTML User Group Meeting*, Oak Ridge National Laboratory, Oak Ridge, TN Sep. 25, 1992.

"Crack-Wake Toughening Mechanisms at High Temperatures in an Extruded Alumina Short Fiber/Cordierite Matrix Composite," *94th Annual Meeting of The American Ceramic Society*, Minneapolis, MN Apr. 12-16, 1992.

"Alumina Short Fiber Reinforced Cordierite Model Composites for the Study of Interphase Effect on Toughness," *1991 TMS Fall Meeting*, Cincinnati, OH, Oct. 8-11, 1991.

"High Temperature Whisker Pullout in Ceramic Composites," *93rd Annual Meeting of The American Ceramic Society*, Cincinnati, OH, Apr. 28-May 2, 1991.

"High Temperature Fracture Mechanisms in Short-Fiber Reinforced Ceramic Matrix Composites," *12th Annual University-Industry Research Symposium*, Center for Composite Materials, Univ. of Delaware, Newark, DE, Sep. 11-13, 1990.

"Effect of Fracture Temperature and Relative Crack Propagation Rate on The Fracture Behavior of Whisker Reinforced Ceramic Matrix Composites," *14th Annual Conference on Composites and Advanced Ceramics,* Cocoa Beach, FL, Jan. 14-17, 1990.

"Elevated Temperature Fracture Behavior of Whisker-Reinforced Ceramic Composites," *11th Annual University-Industry Research Symposium*, Center for Composite Materials, Univ. of Delaware, Newark, DE, Sep. 19-21, 1989.

"Fracture Behavior of Whisker-Reinforced Ceramic Composites," *10th Annual University-Industry Research Symposium*, Center for Composite Materials, Univ. of Delaware, Newark, DE, Sep. 19-21, 1988.