

*Curriculum Vitae*  
**ANETTE M. KARLSSON, PHD**

Department of Mechanical Engineering  
University of Delaware  
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## EDUCATION

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**Doctor of Philosophy**, Mechanical and Aerospace Engineering, 1999, Rutgers University, NJ  
**Master of Science**, Mechanical Engineering, 1990, The University of Linköping, Linköping, Sweden.  
**Bachelor of Science**, Mechanical Engineering, 1989, The University of Linköping, Linköping, Sweden

## PROFESSIONAL HISTORY

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<b>Interim Chairperson</b>	Mechanical Engineering University of Delaware	2008 – 2009
<b>Associate Professor</b>	Mechanical Engineering University of Delaware	2007 – present
<b>Assistant Professor</b>	Mechanical Engineering University of Delaware	2002 – 2007
<b>Research Associate</b>	Princeton Materials Institute Princeton University, NJ	1999 – 2002
<b>Lecturer and Research Assistant</b>	Rutgers University, NJ	1994 – 1999
<b>Technical Attaché of Material Science</b>	Embassy of Sweden, Washington, DC	1992 – 1994
<b>Research Engineer</b>	Saab Missiles, Linköping, Sweden	1989 – 1992

## HONORS AND AWARDS

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**The Young Scholars Award of the Francis Alison Society**, December 2005

The annual award is given to one Assistant Professor at the University for Outstanding Scholarship.

**Office of Naval Research Young Investigator Award**, June 2004

The annual award is given to a limited number of young researchers “based on their academic achievements, their ability to contribute to the strength of the nation’s research and development.”

**The Commission on the Status of Women’s 2002-2003 Special Travel Award**, University of Delaware, November 2002

## SPECIAL INVITATIONS

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**Invited Lecturer** to the Conference on Layered, Functional Gradient Ceramics and Thermal Barrier Coatings: Design, Fabrication and Applications, sponsored by The European Commission: Improving Human Research Potential and the Socio-economic Knowledge Base. Minorca Island, June 11 – 16, 2006. Visit funded by the European Commission

**Invited Guest Scientist** to the German Aerospace Center, Köln (Cologne), December 8-13, 2003. Visit funded by the German Aerospace Center.

**Invited Speaker** to the Gordon Conference: High Temperature Corrosion, July 20-25, 2003, (Participation by invitation only, expenses paid by The Gordon Research Conference)

**Invited Guest Scientist** at the Institute of Industrial Science, The University of Tokyo, March 21 – 31, 2003. Visit funded by the Center of Excellence, the Japanese Ministry of Education, Japan.

## RESEARCH GRANTS/CONTRACTS

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### *Current*

#### **Principal Investigator**

**ARO:** High Strength and Light-weight Materials Inspired by the Exoskeleton of Arthropods. Date: 1/1/09 to 6/30/09

**DoE** (subcontract via WL Gore and Associates) :Low Cost, High Volume Membrane Electrode Assemblies Engineered for Rapid Conditioning. Date: 10/1/08 to 9/30/09. Co-PI: Professor M.H. Santare, Department of Mechanical Engineering.

**NSF:** The Mechanics of Debonding of Foam Core Sandwich Structure Under Cyclic Loading. Date: 8/1/08 to 7/31/11. Co-PI: L.A. Carlsson, Florida Atlantic University

**NSF:** Material World Network: Interaction of Time- and Load-History Dependent Degradation of Multilayered Materials Subjected to High Temperatures. Date: 8/01/07 to 7/31/10

**DuPont Center for Collaborative Research & Education:** Fuel Cell Durability. Date: December 15, 2004 until spent

#### **Co-Principal Investigator**

**UDRF Strategic Initiative Award** *Effects of Bisphosphonate Treatment on Osteoarthritic Knee* PI: Liyun Wang (ME). Date: January 1, 2009 to May 31, 2009.

**DOE** (Subcontract through Nuvera Fuel, Cambridge, MA) *Mechanics of Freeze-Thaw in Polymer Electrolyte Membrane Fuel Cells* PI: M.H. Santare Date: 4/1/07 to 3/31/10

### *Past*

#### **Principal Investigator**

**Army Research Office, Defense University Research Instrumentation Program (DURIP):** Acquisition of a Nanoindenter for Mechanical and Electrical Properties of Multifunctional Materials. Date: August 1, 2007 to July 31, 2008. Co-PIs: O. Olowolafe, Electrical and Computer Eng., R. Opila, Materials Science and Eng.

**The Delaware Economic Development Office:** The Clean Energy Center Partnership Advisory Board, and W.L. Gore and Associates: *Time and History Dependent Behavior of Polymer Fuel Cell Membranes*. Date: 2/1/2008 to 1/31/2009. Co-PI: M.H. Santare, Department of Mechanical Engineering.

**Delaware Space Grant Consortium.** Undergraduate summer research internship for Chase Ross and Amelia House. Date June 1, 2007 to August 31, 2007

**University of Delaware Research Foundation, Inc.:** *Research Experience for Undergraduates (REU)*  
Date: From June 1, 2007 to August 31, 2007

**The Delaware Economic Development Office:** The Clean Energy Center Partnership Advisory Board, and W.L. Gore and Associates: *Mechanical Degradation of Polymer Fuel Cell Membranes*. Date: 9/1/2006 to 1/31/2008. Co-PI: M.H. Santare, Department of Mechanical Engineering.

**University of Delaware Research Foundation, Inc.:** *Exoskeleton Materials of Arthropods as Inspiration for Structural Materials*. Date: From June 1, 2006 to May 31, 2007

**W.L. Gore and Associates,** *Durability of Fuel Cell Membrane Materials*. Amount: \$60,000. (\$30,000 from W.L Gore and \$30,000 from College of Engineering and Department of Mechanical Engineering). Co-PI: M.H. Santare, Department of Mechanical Engineering

**ONR** Young Investigator Award, *Development of a Life-prediction Methodology for Multilayered and Coated Structures*. Date: June 1, 2004 to May 31, 2007

NSF NSF-EC Cooperative Activity in Materials Research: *Failure Mechanics of Layered Ceramics and Ceramic-Metal Coatings Due to Environmental Exposure*. Date: June 15 2004 to May 31, 2007

### **Co-Principal Investigator**

**The Delaware Economic Development Office:** The Clean Energy Center Partnership Advisory Board, and W.L. Gore and Associates: *Enhancing Durability of Polymer Fuel Cell Membranes*. PI: MH Santare, Dept. Mechanical Engineering

**The Federal Transit Administration:** *Full Cell Buss: Durability issues of polymer fuel cell membranes*. PI: Ajay Prasad, Dept. Mechanical Engineering, Date: 8/25/2005 to 8/23/2008.

**Department of Energy:** *Development of Fuel Cell Technology*. PI: JQ Chen, Dept. of Chemical Engineering. \$1,000,000. Date: 6/1/2004 to 10/31/2005.

## **RESEARCH MENTORING**

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### **Advised Students, Post Doctoral Researchers and Visiting Scientists:**

#### **Graduated Doctoral Student (3 total)**

Jun Shi, Ph.D. May 2006 (Now at Sterling Software, in Michigan)

*Thesis:* On Thermal Mismatch and thermal gradients and the failure of thermal barrier coatings

Jin Yan, Ph.D. August 2007 (Now at Princeton University, NJ)

*Thesis:* Aspects of instrumented indentation with applications to thermal barrier coatings

Dan Cojocaru, Ph.D. August 2008 (Now at SIMULA (ABAQUS), Providence, RI)

*Thesis:* A Numerical Approach to Fatigue Predictions

#### **Doctoral Students**

Liang Chen (expected Ph.D. 2010)

Mercedes Hernandez (expected Ph.D. 2010)

Ahmet Kusoglu (co-advised with Dr. Santare, expected Ph.D. 2009)

Yun Wang (expected Ph.D. 2011)

Arun Agrawal (Completed Candidacy exam 2006, but thesis not completed)

#### **Master's Degree Student**

Melissa Lugo (Expected MS 2009)

Narinder Singh (Expected MS 2009)

#### **Visiting Graduate Students**

Parya Naghypour (PhD student, the German Aerospace Center, Dr. Bartsch)

#### **Undergraduate Student**

*Current:*

Alex Aten (Class of 2011), Tom Cender (2010), James Sargianis (2010), Sarah O'Neil (2009), Chase Ross (2009)

*Graduated:*

Chad Agostinelli (2008), Michael Brill (2008), Amelia House (2008), Alexander Reeser (2008), Michael Gilbert (2007), Kevin Pulley (2007), Daniela Wagus (2006), Justin Caulfield (2005), Anthony Davis (2005), DiEna Davis (2005)

#### **Visiting Undergraduate Students**

*Summer 2005:* Adam Gormely (from Lehigh University), Laura Reibeck (from Lafayette College)

#### **Post doctoral researchers:**

Dr. Yaliang Tang, November 1, 2004 – July 31, 2008 (co-advised with Dr. Santare)

Dr. Prakash Jadhav, July 1, 2005 – June 30, 2006

#### **Visiting Scientists**

Dr. Severine Darzens, March– May 2003

Matthiue Vandamme, Ecole Polytechnique, Paris, France, Jan. – July 2004

Professor Mosobalájé O. Adéoyè, Obafemi Awolowo University, Ile-Ife, Nigeria, Sept – Dec 2007

**Doctoral Thesis Committee Member for:**

*Mechanical Engineering*

Alper Tasdemirci	PhD, October, 2005	Advisor: Dr. Hall
Fuping Zhou	PhD, January, 2006	Advisor: Dr. Advani
Hehe Zhou	PhD, July 2006	Advisor: Dr. Novotny
Dan Su	PhD, August 2007	Advisor: Dr. Santare
Michael Minnicino	PhD, Candidacy Exam 2008	Advisor: Dr. Santare

*Chemical Engineering*

Laetitia Bonnaillie	PhD, September 2007	Advisor: Dr. Wool
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*Materials Science and Engineering*

Beverly Wright	PhD, Candidacy Exam 2008	Advisor: Dr. Opila
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**Master's Thesis Committee Member for:**

Oluseyi O. Onawola	Master's Thesis, 2004	Advisor: Dr. Vinson
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**TEACHING**

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**Undergraduate:**

Mechanic of Solids; Mechanical Behavior of Solids and Structures, Analysis of Aircraft Structures, Interfacial Fracture Mechanics, Measurement Techniques for Mechanical Properties

**Graduate Level:**

Mechanical Behavior of Solids and Structures, Analysis of Aircraft Structures Fracture Mechanics, Interfacial Fracture Mechanics, Non-Linear Constitutive Equations, Computational Fracture Mechanics

**PROFESSIONAL SERVICE**

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**Symposium Organizer at International Meetings**

- *Symposium on Advance Ceramic Coatings for Structural, Environmental and Functional Applications*, co-organizer with eleven other international organizers. A five day symposium in conjunction with the 33<sup>rd</sup> International Conference & Exposition on Advance Ceramics and Composites, 2009
- *Symposium on Advance Ceramic Coatings for Structural, Environmental and Functional Applications*, co-organizer with eleven other international organizers. A five day symposium in conjunction with the 32<sup>nd</sup> International Conference & Exposition on Advance Ceramics and Composites, January 27- February 1, 2008.
- *Symposium on Advance Ceramic Coatings for Structural, Environmental and Functional Applications*, co-organizer with eleven other international organizers. A five day symposium in conjunction with the 31<sup>st</sup> International Cocoa Beach Conference & Exposition on Advance Ceramics and Composites, January 21-26, 2007.

**“Topical Organizer” at the ASME International Engineering Congress and Exposition**

As a Topical Organizer, my responsibilities include: Overseeing the technical content of the technical area; Determine acceptance of abstracts submitted to the technical area; Create and assemble sessions; Assign session personnel to organize and moderate sessions; Monitor the paper review process; Assist in reviewing papers; Monitor the activity of the session personnel and assist them as needed; Ensure the on-site success of the sessions.

- *Aerospace Structures and Materials*: 8 sessions, ASME International Mechanical Engineering Congress and Exposition, Boston, MA, November, 2008.
- *Aerospace Structures and Materials*: 8 sessions, ASME International Mechanical Engineering Congress and Exposition, Seattle, Washington, November, 2007.

- *Aerospace Structures and Materials*: 20 sessions, ASME International Mechanical Engineering Congress and Exposition, Chicago, Illinois, November, 2006.
- *Multifunctional Materials and Materials Systems*, 12 sessions; Co-sponsored by the Aerospace, Materials and Transportations Divisions. ASME International Mechanical Engineering Congress and Exposition, Chicago, Illinois, November, 2006.
- *Multifunctional Materials and Materials Systems*, 11 sessions; Sponsored by the Aerospace and Materials Divisions. ASME International Mechanical Engineering Congress and Exposition, Orlando Florida, November, 2005.
- *Multifunctional Materials and Materials Systems*, 5 sessions. Sponsored by the Materials Division. ASME International Mechanical Engineering Congress and Exposition, Anaheim, CA, November 13-19, 2004.

**“Session Organizer” at the ASME International Engineering Congress and Exposition**

As a Session Organizer” I recruited speakers to the sessions, requested sessions from the Topical Organizer; and conducted the review process.

- *Durability and Damage Tolerance of Heterogeneous Materials and Structures*, 5 sessions. Co-sponsored by Division of Aerospace, Applied Mechanics, Materials. ASME International Mechanical Engineering Congress and Exposition, Anaheim, CA, November 13-19, 2004.
- *Durability and Damage Tolerance of Heterogeneous Materials and Structures*, 7 sessions spanning four days. Co-sponsored by Division of Aerospace, Applied Mechanics, Materials, Non-Destructive Evaluation. ASME International Mechanical Engineering Congress and Exposition, Washington DC, November 16-21, 2003.

**C. Professional Memberships**

- American Ceramic Society
  - *Awards Committee of the Engineering Ceramic Division* 2001-2002
  - *Awards Committee for the W. David Kingerly Award* 2006 - present
- American Institute of Aeronautics and Astronautics (AIAA)
- American Society for Engineering Education (ASEE)
- American Society of Mechanical Engineers (ASME)
  - Active Committee-Group Membership** (= co-organizing sessions at ASME meetings)
  - *Multifunctional Materials* *Founding Chair* 2004 - present
  - *TC Metals Group (Division of Materials)* *Chair* 2004
  - *Aerospace Materials and Structures (Division Aerospace)* *Member* 2002 – 2004
  - *Aerospace Materials and Structures (Division Aerospace)* *Member* 2003 – present
    - **Vice-Chair** 2009-2011
    - **Topical Organizer for ASME Congress**: 2006 – 2008.
    - **Secretary**: 2005 – 2009
    - **Chair**: *Best paper award* 2004 - 2006
  - *Member of TC Composite Materials (Division Materials)* *Member* 2001 – 2005
  - *Member of TC Composite Materials (Division Applied Mechanics)* *Member* 2001 – 2005
- Materials Research Society (MRS)
- Sigma Xi

**D. Proposal Reviews**

- The Air Force Office of Scientific Research (AFOSR) through the National Research Council
- City University of New York: Internal Research Award Program (2002-current)
- Department of Energy, Small Business Innovation Research (SBIR) program
- European Science Foundation (ESF), single proposal review (2004)
- European Science Foundation (ESF), pool of referee May 1, 2006 – April 30, 2009
- NSF single proposal review (DMR-ceramics 2004 - present, metals 2004 - present, CMS 2003, 2004)
- NSF Review panel DMR FY 2005
- NSF Site visit to USAMI International Materials Institute (2006)

### E. Reviewer for the following journals

ASME Proceedings, Acta Materialia, Composites A: Applied Science and Manufacturing, Composite Science and Technology, Computational Materials Science, Engineering Fracture Mechanics, Fuel Cells  
IEEE Transaction on Nanotechnology, International Journal of Applied Ceramic Technology, International Journal of Hydrogen Energy, International Journal of Mechanical Sciences, Journal of Applied Mechanics  
Technology, Journal of Applied Mechanics, Journal of Composites Technology and Research, Journal of Fuel Cell Science and Technology, Journal of Materials; Journal of Mechanics of Materials and Structures, Journal of Engineering Materials and Technology, Journal of Materials Engineering and Performance, Journal of Materials Research, Journal of Non-linear Mechanics,  
Journal of Power Sources, Materials Letters, MRS Bulletin, Materials Science and Engineering A, Mechanics of Materials, Mechanics of Time-Dependent Materials, Metallurgical and Materials Transaction, A, Philosophical Magazine Letters, Scripta Materialia, Surface and Coatings Technology.  
Thin Solid Films, Transactions on Nanotechnology

### SERVICE GRANTS

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**Investigator: NSF:** Resources for Recruitment and Retention for Women faculty in STEM Fields at the University of Delaware (**PI:** Michael Chajes). 2008-20012

**Principal Investigator:** NEC SMARTer Kids Foundation, *Purchase of LCD projector to enhance communication and presentation skills among undergraduate engineering students.* 2004.

### ADDITIONAL INFORMATION

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Listed in            Marquis Who's Who in America 2002 – date  
                          Marquis Who's Who of American Education 2006 – date  
                          Marquis Who's Who of American Women 2002 – date  
                          Marquis Who's Who in Science and Engineering 2004 – date

### PUBLICATIONS

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#### A. Guest Editor

Journal of Engineering Materials and Technology, Special Issue on Durability and Damage Tolerance of Heterogeneous Materials and Structures, October 2003

#### B. Book Chapters

**A.M. Karlsson**, M. O. Adeoye, Multifunctional Composites, Encyclopedia of Complexity and System Science, Springer Publishing Company. In press.

*Progress in Astronautics and Aeronautics* series

#### C. Refereed Journal Articles

1. A. Kusoglu, Y. Tang, M. Lugo, **A.M. Karlsson**, M.H. Santare, Mechanical properties of perfluorosulfonic acid membranes in liquid water, *to be submitted; waiting approval from Company Sponsor*
2. M. Hernandez, **A.M. Karlsson**, M. Bartsch, On the role of creep in the evolution of cracks in thermal barrier coating, *Submitted to Surface and Coatings Technology*, January 2009

3. L. Cheng, L. Wang and **A.M. Karlsson**, On the microstructure and mechanical behavior of the exoskeleton in *Popillia japonica*, *Submitted to J Materials Research, January 2009*
4. A. Kusoglu, M.H. Santare, A.M. Karlsson, Mechanics-based model for non-affine swelling in perfluorosulfonic acid (PFSA) membranes, *Submitted to Polymer, January 2009*
5. D. Cojocaru and **A.M. Karlsson**, On the effective properties of macroscopically isotropic media containing randomly dispersed spherical particles, *Submitted to International Journal of Solids and Structures, Oct. 2008*
6. D. Cojocaru and **A.M. Karlsson**, Assessing Plastically Dissipated Energy as a Condition for Fatigue Crack Growth, *International Journal of Fatigue, To appear July 2009.*
7. J. Yan, **A.M. Karlsson**, M. Bartsch, X. Chen, On stresses induced in a thermal barrier coating due to indentation testing, *Computational Materials Science*, **44(4)** 1178-1191 (2009)
8. A. Kusoglu, Y. Tang, M.H. Santare, **A.M. Karlsson**, S. Cleghorn and W. B. Johnson, Temperature and Humidity Dependent Phenomenological Constitutive Model for Plastic Flow Behavior of PFSA Membranes, *to appear in Journal of Fuel Cells Science and Technology, Vol 9*, February paper # 011012 (8 pages) (2009)
9. L. Cheng, L. Wang and **A.M. Karlsson**, Image analyses of two crustacean exoskeletons and implications of the exoskeletal microstructure on the mechanical behavior, *J Materials Research* **23(11)**, 2854-2872 (2008)
10. A. Kusoglu, M.H. Santare, **A.M. Karlsson**, S. Cleghorn and W. B. Johnson, Micro-mechanics model based on the nanostructure of PFSA membranes, *Journal of Polymer Science Part B: Polymer Physics*, **46** 2404–2417 (2008)
11. A. Kusoglu, A.M. Karlsson, M.H. Santare, S. Cleghorn, W.B. Johnson, "Investigation of Stress and Water Distribution in Membrane Electrode Assembly (MEA) During Fuel Cell Operation", *ECS Transactions*, **16** (2) 551-561 (2008).
12. **A.M. Karlsson**, Response to Discussion: On the Reference Length and Mode Mixity for a Bimaterial Interface (Agrawal and Karlsson, 2007 *ASME J. Engineering Materials and Technology*, v129 pp 580: 580-587), *J. of Engineering Materials and Technology*, **130(1)** 045502 (1 page) (2008)
13. D. Cojocaru and **A.M. Karlsson**, An object-oriented approach for modeling and simulation of interfacial crack growth of cyclically loaded structures, *Advances in Engineering Software*, **39(12)** 995-1009 (2008)
14. J. Yan, T. Leist, M. Bartsch, **A.M. Karlsson**, On cracks and delaminations of TBCs due to indentation testing: An experimental assessment, *Acta Materialia* **56(15)** 4080 – 4090 (2008)
15. Y. Tang, A. Kusoglu, **A.M. Karlsson**, M.H. Santare, S. Cleghorn and W. B. Johnson, Mechanical Properties of a Reinforced Composite Polymer Electrolyte Membrane and its Simulated Performance in a PEM Fuel Cell, *Journal of Power Sources*, **175(2)** 817-825 (2008)
16. A. Agrawal and **A.M. Karlsson**, On the Reference Length and Mode Mixity for a Bimaterial Interface, *J. of Engineering Materials and Technology*, **129** 580-587 (2007)
17. J. Yan, **A.M. Karlsson**, X. Chen, On Internal Cone Cracks Induced by Conical Indentation in Brittle Materials, *Engineering Fracture Mechanics*, **74(16)** 2535-2546 (2007)
18. M. Bartsch, B. Baufeld, M. Heinzelmann, **A.M. Karlsson**, S. Dalkili, L. Chernova, Multiaxial thermo-mechanical fatigue on materials systems for gas turbines, *Materialwissenschaft und Werkstofftechnik*, **38(9)** 712-719 (2007)
19. A. Kusoglu, **A.M. Karlsson**, M. H. Santare, S. Cleghorn and W. B. Johnson, Mechanical Behavior of Fuel Cell Membranes under Humidity Cycles and Effect of Swelling Anisotropy on the Fatigue Stresses, *J. of Power Sources*, **170** 345-558 (2007)
20. J. Yan, **A.M. Karlsson**, X. Chen, Determining Plastic Properties of a Bulk Material With Residual Stress by Using Conical Indentation, *Int. J. of Solids and Structures*, **44** 3720-3737 (2007)

21. **A.M. Karlsson**, Modeling Failures of Thermal Barrier Coatings (invited), *Key Engineering Materials* **333** 155-165 (2007)
22. M. Bartsch, B. Baufeld, S. Dalkili, B. Saruhan, I. Mircea, K. Lambrinou, T. Leist, J. Yan, **A.M. Karlsson**, Time-Economic Lifetime Assessment for High Performance Thermal Barrier Coating Systems, *Key Engineering Material* **333** 147-154 (2007)
23. J. Yan, X. Chen, **A.M. Karlsson**, A New Approach to Measure Equi-Biaxial Residual Stress and Elastic-Plastic Properties by Conical Microindentation, *J. of Engineering Materials and Technology*, **129** 200-206 (2007)
24. A. Kusoglu, **A.M. Karlsson**, M.H. Santare, S. Cleghorn, W. B. Johnson, Mechanical Response of Fuel Cell Membranes Subjected to Hygro-Thermal Loading, *J. of Power Sources* **161** (2) 987-996 (2006)
25. A. Agrawal, **A.M. Karlsson**, Obtaining Stress Intensity Factor-based Mode Mixity for Bimaterial Interface Cracks using the Virtual Crack Closure Technique, *Int. J. of Fracture*, **141(1)** 75-98 (2006)
26. J. Shi, **A.M. Karlsson**, B. Baufeld and M. Bartsch, Evolution of Surface Morphology in Thermo-mechanically Cycled NiCoCrAlY Bondcoats, *Materials Science and Engineering A* **434** 39-52 (2006)
27. D. Cojocar, **A.M. Karlsson**, A Simple Numerical Method of Cycle Jumps for Cyclically Loaded Structures, *Int. J. of Fatigue*, **28** (12) 1677-1689 (2006)
28. Y. Tang, **A.M. Karlsson**, M.H. Santare, M. Gilbert S. Cleghorn, W. B. Johnson, An Experimental Investigation of Humidity and Temperature Effects on the Mechanical Properties of Perfluorosulfonic Acid Membrane, *Materials Science and Engineering A*, **425** 297-304 (2006)
29. J. Caulfield, **A.M. Karlsson** and D.J. Sypeck, On The Crushing of a Textile Core Sandwich Panel, *AIAA Journal*, **44** (6) 1339-1344 (2006)
30. M. Zhao, X. Chen, J. Yan, **A.M. Karlsson**, Determination of Uniaxial Residual Stress and Mechanical Properties by Instrumented Indentation, *Acta Materialia*, **54** 2823-2832 (2006)
31. Y. Tang, M. H. Santare, **A.M. Karlsson**, S. Cleghorn, W. B. Johnson, Stresses in Proton Exchange Membranes due to Hydro-thermal Loading, *J. of Fuel Cells Science and Technology*, **3** 119-124 (2006)
32. X. Chen, J. Yan, **A.M. Karlsson**, On The Determination of Residual Stresses and Mechanical Properties by Indentation, *Materials Science and Engineering A*, **416** (1-2) 139-149 (2006)
33. S.Q. Guo, D.R. Mumm, **A.M. Karlsson**, Y. Kagawa, Measurement of Interface Shear Mechanical Properties in Thermal Barrier Coating Systems by a Barb Pullout Method, *Scripta Materialia*, **53** 1043-1048 (2005)
34. J. Shi, S. Darzens, **A. M. Karlsson**, Aspects of The Morphological Evolution In Thermal Barrier Coatings and the Intrinsic Thermal Mismatch Therein, *Materials Science and Engineering A*, **392** 301-312 (2005)
35. Y.H. Sohn, B. Jayaraj, S. Laxman, B. Franke, and **A.M. Karlsson**, Non-Destructive and Microstructural Characterization of Thermal Barrier Coatings. *Journal of Materials*, October, 53-57 (2004)
36. S. Darzens, **A.M. Karlsson**, On the Microstructural Development in Pt-modified Nickel-Aluminide Bond Coats, *Surface and Coatings Technology*, **177-178C**, 108-112 (2004)
37. S. Hyun, **A.M. Karlsson**, S. Torquato, A.G. Evans, Simulated Properties of Kagomé Truss Core Panels, *I.J. Solids and Structures* 40 (25) 6989-6998 (2003)
38. **A.M. Karlsson**, On The Mechanical Response of a Thermal Barrier System due to Martensitic Phase Transformation In The Bond Coat, *J. Engineering Materials and Technology* 125 346-352 (2003)
39. **A.M. Karlsson**, J.W. Hutchinson, A.G. Evans, The Displacement of the Thermally Grown Oxide in Thermal Barrier Systems upon Temperature Cycling, *Materials Science Engineering A*. 351 (1-2) 244-257 (2003)

40. **A.M. Karlsson**, J.W. Hutchinson, A.G. Evans, A Fundamental Model of Cyclic Instabilities in Thermal Barrier Systems, *J. Mech. and Physics Solids* 50 (8) 1565-1589 (2002)
41. **A.M. Karlsson**, C.G. Levi, A.G. Evans, A Model Study of Displacement Instabilities During Cyclic Oxidation. *Acta Materialia* 50(6) 1263-1273 (2002)
42. **A.M. Karlsson**, T. Xu, A.G. Evans, The Effect of the Thermal Barrier Coating on the Displacement Instability in Thermal Barrier Systems, *Acta Materialia* 50(5) 1211-1218 (2002)
43. **A.M. Karlsson**, A.G. Evans, Numerical Model for the Cyclic Instability of Thermally Grown Oxides in Thermal Barrier Systems, *Acta Materialia*, 49 (10) 1793-1804 (2001)
44. **A.M. Karlsson**, The Effects of Patch Properties on Debonding Behavior of Patched Beam-plates, *J. of Engineering Materials and Technology* 122 (4) 389-393 (2000)
45. **A.M. Karlsson**, W.J. Bottega, Thermo-Mechanical Response of Patched Plates, *AIAA Journal*, 38 (6) 1055-1062 (2000)
46. **A.M. Karlsson**, W.J. Bottega, On Thermal Buckling of Patched Beam-Plates, *Int. J. of Solids and Structures* 37 (34) 4655-4690 (2000)
47. **A.M. Karlsson**, W.J. Bottega, On the Behavior of a Class of Patched Plates During Cooling, *Int. J. of Non-Linear Mechanics* 35 (3) 543-566 (2000)
48. **A.M. Karlsson**, W.J. Bottega, On the Detachment of Step-Tapered Doublers. Part 2 – Evolution of Pressure Loaded Structures, *Int. J. of Solids and Structures* 36 1625-1651 (1999)
49. W.J. Bottega, **A.M. Karlsson**, On the Detachment of Step-Tapered Doublers. Part 1 – Foundations, *Int. J. of Solids and Structures* 36 1597-1623 (1999)
50. **A.M. Karlsson**, W.J. Bottega, The Presence of Edge-Point Contact and Its Influence on the Debonding of Patched Panels, *Int. J. of Fracture* 96 (4) 383-406 (1999)

#### D. Conference Proceedings

1. A. Kusoglu, **A. M. Karlsson**, M.H. Santare, S. Cleghorn, W.B. Johnson, Investigation of stress and water distribution in membrane electrode assembly (MEA) during fuel cell operation, The Electrochemical Society, Honolulu, Hawaii, October 12-17, 2008
2. M. Bartsch, B. Baufeld, J. Shi, and **A. M. Karlsson**, Morphological instabilities of metallic oxidation protection coatings for gas turbine blades, ODAS 2006, Toulouse, France, October 4-6, 2006
3. A. Agrawal and **A.M. Karlsson**, Mode Mixity Issues in Interfacial toughness measurement of Bilayer Specimens, SAMPE 06, Long Beach, CA, Apr 30 – May 4, 2006
4. J. Caulfield, **A.M. Karlsson** and D.J. Sypeck, On The Crushing of a Textile Core Sandwich Panel, 46th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics & Materials Conference, Austin, Texas, April 18-21, 2005
5. Y. Tang, M. H. Santare, **A.M. Karlsson**, S. Cleghorn, W. B. Johnson, Stresses in Proton Exchange Membranes due to Hydration-dehydration Cycles, FUELCELL2005: Third International Conference on Fuel Cell Science, Engineering and Technology May 23 - 25, 2005, Ypsilanti, Michigan
6. J. Shi and **A. M. Karlsson**, B. Baufeld and M. Bartsch, On The Thermal Cycling And Evolution Of Surface Morphology For Thermally Cycled Nicocraly Bondcoats, 29<sup>th</sup> International Cocoa Beach Conference on Advance Ceramics and Composites, 26(3), p 65-72 (2005)
7. J. Shi and **A.M. Karlsson**, On Misfit Strains and Fatigue in a Class of Thermal Barrier Coatings, 17th ASCE Engineering Mechanics Conference, June 13-16 University of Delaware, Newark, DE (2004)
8. J. Shi, S. Darzens and **A.M. Karlsson**, The Effect of Thermal Mismatch on Stresses, Morphology and Failures in Thermal Barrier Coatings, 28<sup>th</sup> International Cocoa Beach Conference on Advance Ceramics and Composites: B345-350 (2004)

9. S. Darzens, **A.M. Karlsson**, On the Microstructural development in Pt-modified Nickel-Aluminide Bond Coats, *The International Conference on Metallurgical Coatings and Thin Films*, ICMCTF 2003.
10. R. L. Lehman, V. G. Petrany, **A.M. Karlsson**, C. R. Flynn, “The Differing Influences of 33 and 51 Expansion Glass on the Failure of Glass Vials During Lyophilization Processing”, *International Society for Pharmaceutical Science and Technology* [PDA], limited published proceedings of the 2002 Annual Meeting, (2003).
11. **A.M. Karlsson**, Development of Morphology and Stresses in a Class of Thermal Barrier System During Thermal Cycling, 27<sup>th</sup> International Cocoa Beach Conference on Advance Ceramics and Composites: A 543 -548 (2003)
12. **A.M. Karlsson**, A.G. Evans, A Numerical Simulation of Ratcheting in Thermal Barrier Systems, *MRS 2000 Fall Meeting*, Boston, MA, Nov 27 – Dec 1, 2000.
13. **A.M. Karlsson**, W.J. Bottega, Aspects of Thermally Induced Buckling of Patched Structures, *AIAA-99-1231, 40<sup>th</sup> AIAA/ASME/ASCE/AHS/ASC SDM Conference*. St. Louis, MO, April 12 – 15, pp 278-288, 1999.

## PRESENTATIONS

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### A. Invited Presentations

1. A.M. Karlsson, Assessing Plastically Dissipated Energy as a Condition for Cyclic Crack Growth in Numerical Simulations, *City College of New York*, April 2, 2009
2. A.M. Karlsson, Mechanics of Proton Exchange Fuel Cell Membranes, *University of Connecticut*, Storrs, CT, April 18, 2008.
3. A.M. Karlsson, M. Hernandez, D. Cojocar, M. Bartsch, The role of creep in the evolution of fatigue cracks in thermal barrier coatings, *German Aerospace Center (DRL)*, Cologne, Germany, August 20, 2007
4. A.M. Karlsson, Predicting Failures of Structures with Evolving Properties: A Mechanics Approach, *Rutgers University*, New Jersey, October 11, 2006
5. A.M. Karlsson, *Modeling Failures of Thermal Barrier Coatings, Layered, Functional Gradient Ceramics and Thermal Barrier Coatings: Design, Fabrication and Applications*, sponsored by The European Commission: Improving Human Research Potential and the Socio-economic Knowledge Base. Minorca Island, June 11 – 16, 2006.
6. A.M. Karlsson, On The Failure of Cyclically Loaded Thermal Barrier Coatings, *German Aerospace Center (DRL)*, Cologne, Germany, June 30, 2005
7. A.M. Karlsson, Evolution of Surface Morphology in Thermo-Mechanically Cycled NiCoCrAlY bondcoats, *Forschungszentrum Karlsruhe* (Research Center, Karlsruhe), Karlsruhe, Germany, June 28, 2005
8. A.M. Karlsson, A Mechanics Based Approach to Failures of Environmental Barrier Coatings, *GE Aircraft Engines*, Cincinnati, OH, June 9, 2005
9. A.M. Karlsson, Failure Evolution in a Class of EB-PVD Coated Thermal Barrier Systems, *The Swedish Energy Consortium*, Finspong, Sweden, October 27, 2004 (visit funded by Linköping University)
10. A.M. Karlsson, Life Prediction Models for Evolving Heterogeneous Material Systems, *Department of Applied Mathematics Lunch-Seminar*, University of Delaware, April 23, 2004
11. A.M. Karlsson, How to Predict Failures in Advanced Materials and Materials Structures: Mechanics of Materials and Materials Mechanics, *GE Aircraft Engines*, Cincinnati, OH, January 14, 2004

12. A.M. Karlsson, Thermal Fatigue of Thermal Barrier Coatings: Linking Materials Science to Applied Mechanics, *The Annual Research Colloquium at the German Aerospace Center*, Köln (Cologne), Germany, December 10, 2003 (visit funded by the German Aerospace Center)
13. A.M. Karlsson, Aspects of Stress Development in Thermal Barrier Coatings due to the Formation of the Thermally Grown Oxide – A Mechanics Approach, *Gordon Conference on High Temperature Oxidation*, July 2003 (participation funded by the Gordon Research Conference)
14. A.M. Karlsson, Simulation of Stresses and Delamination in a Plasma Sprayed Thermal Barrier System Upon Thermal Cycling, *International Thermal Spray Conference and Exposition*, May 5-8, Orlando, Florida (participation funded by the conference chair)
15. AM Karlsson, Failure Mechanics in Coated Structures Subjected to Corrosive Thermal Environments, Institute for Industrial Sciences, *University of Tokyo*, Tokyo, March 25, 2003. (visit funded by the University of Tokyo)
16. A.M. Karlsson, Failure Mechanics of Coatings for Thermal Protections, Oak Ridge National Laboratory, Oak Ridge, TN January 16, 2003
17. A.M. Karlsson, A.G. Evans, A Fundamental Model of Cyclic Instabilities in Thermal Barrier Systems, *Workshop on the Science and Technology of Thermal Barrier Coatings*, Absecon NJ, September 10-12, 2001.
18. A.M. Karlsson, A.G. Evans, On the optimal design of joints in truss structures, *Ultralight Metals Workshop 2000*, Brewster, MA, August 23-25, 2000.
19. A.M. Karlsson, Thermo-Mechanical Response of Patched Plates, *Seminar Series in the Department of Mechanical Engineering at New Jersey Institute of Technology*, Oct. 6, 1999.

## **B. Conference Presentations**

1. M. Hernandez, A.M. Karlsson, M. Bartsch, On TGO tensile cracks and creep in accelerated thermo-mechanical fatigue testing of thermal barrier coatings, *32<sup>nd</sup> International Conference & exposition on Advanced Ceramics & Composites*, Daytona Beach, Florida, January 27-February 1, 2008.
2. D. Cojocaru, AM Karlsson, Modeling and Simulation of Interfacial Crack Growth of Cyclically Loaded Structures, *17<sup>th</sup> International Workshop on Computational Mechanics of Materials*, University of Mines Paris, August 22-24 2007.
3. M. Hernandez, A.M. Karlsson, M. Bartsch, Aspects of Internal Cracks due to Thermo-mechanical Fatigue Testing of Multilayered Functional Coatings, *ASME Applied Mechanics and Materials Conference*, Austin, TX, June 3-7, 2007.
4. D. Cojocaru, AM Karlsson, Modeling and simulation of interfacial crack growth of cyclically loaded layered structures, *ASME Applied Mechanics and Materials Conference*, Austin, TX, June 3-7, 2007.
5. M. Hernandez, A.M. Karlsson, M. Bartsch, On the development of bond coat cracks during accelerated thermo-mechanical fatigue testing of thermal barrier coatings, *31th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Jan 22 –Jan 26, 2007.
6. J. Yan, A.M. Karlsson, M. Bartsch, X. Chen, Aspects of cone cracks and delaminations in cracks induced from instrumented indentation of a thermal barrier coating, *31th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach, Jan 22 –Jan 26, 2007.
7. M Hernandez, A.M. Karlsson and M. Bartsch, On Interfacial Crack Kinking in Cyclically Loaded Multilayered Structures , *ASME International Mechanical Engineering Congress and Exposition*, Chicago, IL, Nov 5-10, 2006
8. A.M. Karlsson and D. Cojocaru, Accelerated Numerical Simulations of Evolution of Multilayered Systems Subjected to Thermal Cycling, *15<sup>th</sup> US National Congress of Theoretical and Applied Mechanics*, Boulder, CO, June 25-30, 2006

9. J. Shi, A. M. Karlsson, B Baufeld and M. Bartsch, On Crushing and Crack-initiation in a Thermal Barrier Coating during Instrumented Indentation, *30th International Conference & Exposition on Advanced Ceramics & Composites*, Cocoa Beach, Jan 22 –Jan 27, 2006.
10. J. Yan, A. M. Karlsson, B Baufeld and M.Bartsch, Morphological Surface Instabilities on Thermo-mechanically Cycled NiCoCrAlY Bond Coats, *30th International Conference & Exposition on Advanced Ceramics & Composites*, Cocoa Beach, Jan 22 –Jan 27, 2006.
11. J. Caulfield, A.M. Karlsson and D.J. Sypeck, On The Crushing of a Textile Core Sandwich Panel, *46th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics & Materials Conference*, Austin, Texas, April 18-21, 2005
12. J. Shi, A. M. Karlsson, B Baufeld and M.Bartsch, Evolution of Surface Morphology for Thermo-Mechanically Cycled NiCoCrAlY Bondcoats, *29th Annual Cocoa Beach Conference & Exposition*, Cocoa Beach, Jan 24 –Jan 28, 2005.
13. A.M. Karlsson, J. Shi, S. Darzens, The Effect of Thermal Mismatch on Stresses, Morphology and Failures in Thermal Barrier Coatings, *28th Annual Cocoa Beach Conference & Exposition*, Cocoa Beach, Jan 26 –Jan 30, 2004.
14. A.M. Karlsson, Failure Mechanics of Multilayered Systems with Internal Oxidation, *ASME International Mechanical Engineering Congress and Exposition*, Washington DC, November 16-21, 2003.
15. A.M. Karlsson, Aspects of Failures in multilayer Systems Subjected to Interfacial Oxidation, *2003 Mechanics and Materials Conference*, Scottsdale, Arizona, June 17 – 21, 2003
16. A.M. Karlsson, S. Darzens, On the Microstructural Development in Pt-modified Nickel-Aluminide Bond Coats, *The International Conference on Metallurgical Coatings And Thin Films*, ICMCTF 2003.
17. A.M. Karlsson, Development of Morphology and Stresses in a Class Of Thermal Barrier System during Thermal Cycling, *27th Annual Cocoa Beach Conference & Exposition*, Cocoa Beach, Jan 27 –Jan 31, 2003.
18. A.M. Karlsson, Failure Mechanics and Life Prediction of a Class of Thermal Barrier Systems, *ASME International Mechanical Engineering Congress and Exposition*, New Orleans, LA, Nov 17-22, 2002.
19. A.M. Karlsson and A.G. Evans, On the Development of Cyclic Morphological Instabilities in a Class of Thermal Barrier System, *ACerS 104th Annual Meeting*, St. Louis, Missouri, April 28-May 1, 2002
20. A.M. Karlsson and A.G. Evans, Development of Cyclic Displacement Instabilities in Pt-Modified Bond Coats, *International Conference on Metallurgical Coatings and Thin Films*, San Diego, CA, April 22 - 26, 2002.
21. A.M. Karlsson and A.G. Evans, Ratcheting as a Failure Mechanisms in a Class of Thermal Barrier Systems, *Symposium on Thin Films – Stresses and Mechanical Properties, at the MRS 2001 Fall Meeting*, Boston, MA, Nov 26-30, 2001.
22. A.M. Karlsson and A.G. Evans, Morphological Instabilities in a Multi-Layer System with a Thermally Grown Thin Film, *Symposium on Durability and Damage Tolerance of Heterogeneous Materials and Structures at the 2001 ASME International Mechanical Engineering Congress and Exposition*, New York, NY, 11-16, Nov. 2001.
23. A.M. Karlsson and A.G. Evans, Development of Geometric Instabilities in Thermal Barrier Systems due to Thermal Cycling, *The 2001 Applied Mechanics and Materials Summer Conference*, San Diego, CA, June 27-29, 2001.
24. A.M. Karlsson, A.G. Evans, C.G. Levi, Aspects of Cyclic Morphological Instability of Thermal Barrier Systems, *The American Ceramic Society's 103rd Annual Meeting and Exposition*, Indianapolis, IN, April 22-25 2001.
25. A.M. Karlsson, A.G. Evans, A Numerical Simulation of Ratcheting in Thermal Barrier Systems, *MRS 2000 Fall Meeting*, Boston, MA, Nov 27 – Dec 1, 2000.

26. A.M. Karlsson, Modeling the Debonding Behavior of Step-Tapered Patches: Analytical Solutions and Numerical Analysis of Selected Structures, *1999 International Mechanical Engineering Congress & Exposition*, Nashville, TN, Nov. 14 – 18, 1999.
27. A.M. Karlsson, W.J. Bottega, Aspects of Thermally Induced Buckling of Patched Structures, *AIAA-99-1231, 40th AIAA/ASME/ASCE/AHS/ASC SDM Conference*. St. Louis, MO, April 12 – 15, pp 278-288, 1999.

**C. Student/Post Doc. Presentation at National/International Meetings** (presenter underlined)

28. M. Hernandez, A.M. Karlsson, M. Bartsch, On The Role of Creep for the Development of Internal Fatigue Cracks in Thermal Barrier Coatings, *ASME International Mechanical Engineering Congress and Exposition*, Boston, MA, November 1-6, 2008
29. A. Kusoglu, Y. Tang, A. M. Karlsson, M.H. Santare, S. Cleghorn, W.B. Johnson, Mechanical Properties of Polymer Electrolyte Membranes at Subfreezing Conditions, , *ASME International Mechanical Engineering Congress and Exposition*, Boston, MA, November 1-6, 2008
30. A. Kusoglu, A. M. Karlsson, M.H. Santare, S. Cleghorn, W.B. Johnson, Investigation of stress and water distribution in membrane electrode assembly (MEA) during fuel cell operation, The Electrochemical Society, Honolulu, Hawaii, October 12-17, 2008
31. D. Cojocaru and A.M. Karlsson, Modeling and Simulation of Interfacial Crack Growth of Cyclically Loaded Layered Structures, *ASME International Mechanical Engineering Congress and Exposition*, Seattle, WA, November 11-15, 2007
32. M. Hernandez, A.M. Karlsson, M. Bartsch, Internal Delamination Cracks due to Thermo-mechanical Fatigue Testing of Thermal Barrier Coatings, *ASME International Mechanical Engineering Congress and Exposition*, Seattle, WA, November 11-15, 2007
33. Y. Tang, A. Kusoglu, M.H. Santare and A.M. Karlsson, Investigation of Swelling Behavior and Mechanical properties of Perfluorosulfonic Acid Membranes, *ASME International Mechanical Engineering Congress and Exposition*, Seattle, WA, November 11-15, 2007
34. A. Kusoglu, M.H. Santare, Y Tang, A.M. Karlsson, S. Cleghorn, W.B. Johnson, Phenomenological Constitutive Modeling for the Stress-strain behavior of perfluorosulfonic Acid (PFSA) membranes as a function of temperature and humidity. *ASME Applied Mechanics and Materials Conference*, Austin, TX, June 3-7, 2007.
35. D. Cojocaru and A.M. Karlsson, On the failure evolution of multilayered system subjected to thermal cycling, *ASME International Mechanical Engineering Congress and Exposition*, Chicago, IL, Nov 5-10, 2006
36. J. Yan, A.M. Karlsson, and X. Chen, On Residual Stress and Mechanical Properties from the Load-Displacement Curves of Conical Microindentations, , *ASME International Mechanical Engineering Congress and Exposition*, Chicago, IL, Nov 5-10, 2006
37. Y. Tang, A. Kusoglu, M.H. Santare and A.M. Karlsson, Humidity and Temperature Effects on the Mechanical Properties of Perfluorosulfonic Acid Membrane, *ASME International Mechanical Engineering Congress and Exposition*, Chicago, IL, Nov 5-10, 2006
38. A. Agrawal and A.M. Karlsson, Mode Mixity Issues in Interfacial Toughness Measurement of Bilayer Specimens, *SAMPE 06*, Long Beach, CA, Apr 30 – May 4, 2006
39. A. Kusoglu, A.M. Karlsson, M.H. Santare, S. Cleghorn, W.B. Johnson, Stresses in Polymer Electrolyte Membranes due to Hygro-Thermal Loading, *2nd Annual Aerospace/Mechanical Engineering Mini-Symposium*, Plymouth Meeting, PA February 11, 2006
40. Y. Tang, A. Kusoglu, A.M. Karlsson, M.H. Santare, S. Cleghorn, W.B. Johnson, Durability Investigation of Polymer Electrolyte membrane and PEM Fuel Cells, *2nd Annual Aerospace/Mechanical Engineering Mini-Symposium*, Plymouth Meeting, PA February 11, 2006

41. A. Agrawal, A.M. Karlsson, Kinking from an Interface Crack: Effect of Residual Stress, *2nd Annual Aerospace/Mechanical Engineering Mini-Symposium*, Plymouth Meeting, PA February 11, 2006.
42. J. Yan, A.M. Karlsson, X. Chen, On Internal Cone Cracks Induced by Instrumented Indentation of Brittle Materials. *2nd Annual Aerospace/Mechanical Engineering Mini-Symposium*, Plymouth Meeting, PA February 11, 2006.
43. P. Jadhav, A.M. Karlsson, Micro-indentation Experiments to Measure in-Plane Residual Stresses: Design Methodology, *2nd Annual Aerospace/Mechanical Engineering Mini-Symposium*, Plymouth Meeting, PA February 11, 2006.
44. Jun Shi and A.M. Karlsson, Some Observations on the Cyclic Response of Multi Layered Systems with Internal High-Temperature Oxidation, *ASME International Mechanical Engineering Congress and Exposition*, Orlando, FL, Nov 5-11, 2005
45. Jin Yan, Xi Chen, and A.M. Karlsson, A Study of Instrumented Indentation Induced Cracking, *ASME International Mechanical Engineering Congress and Exposition*, Orlando, FL, Nov 5-11, 2005
46. A.M. Karlsson, Yaliang Tang, Michael Santare Stresses in Polymer Electrolyte Membranes Due To Hygro-thermal Loading, *ASME International Mechanical Engineering Congress and Exposition*, Orlando, FL, Nov 5-11, 2005
47. Jin Yan, Xi Chen, A.M. Karlsson, On the Determination of Residual Stresses and Mechanical Properties by Indentation, *ASME International Mechanical Engineering Congress and Exposition*, Anaheim, CA, November 13-19, 2004.
48. Jun Shi and A.M. Karlsson, On The Evolution of Surface Morphology in Multilayered Structures Due To Thermal Cyclic and Thermal Gradients, *ASME International Mechanical Engineering Congress and Exposition*, Anaheim, CA, November 13-19, 2004.
49. Jun Shi and A.M. Karlsson, On Misfit Strains and Fatigue in a Class of Thermal Barrier Coatings, *17th ASCE Engineering Mechanics Conference*, June 13-16 University of Delaware, Newark, DE

#### **D. Invited Service Panel Discussions**

50. Invited Panelist: "Promotion and Tenure" sponsored by the Provost's Office, March 19, 2008
51. Invited Panelist: "Life after Graduate School," sponsored by Women in Engineering, University of Delaware, March 24, 2006.
52. Moderator: "Planning for Success in the Job Hunt," sponsored by Women in Engineering, University of Delaware, January 19, 2005