

Sanjay Raja Arwade
Assistant Professor
Department of Civil & Environmental Engineering
University of Massachusetts, Amherst
Amherst, MA, 01003
413.256.1654
arwade@ecs.umass.edu

Employment

Assistant Professor Civil & Environmental Engineering	2006 - present University of Massachusetts, Amherst
Visiting Assistant Professor Civil Engineering	2006 - 2008 Johns Hopkins University
Assistant Professor Civil Engineering	2002 - 2006 Johns Hopkins University
Visiting Faculty Computer Science Research Institute	Summer 2003 Sandia National Laboratories
Research Assistant Civil & Environmental Engineering	1997-2001 Cornell University
Research Intern Civil Engineering & Operations Research	Summer 1995 Princeton University

Education

Ph.D., Civil & Environmental Engineering Cornell University Major Field: Structural Engineering. Minor Field: Theoretical & Applied Mechanics Dissertation: Stochastic Characterization and Simulation of Material Microstructures with Application to Aluminum. Advisor: Mircea Grigoriu	2002
M.S., Civil & Environmental Engineering Cornell University Major Field: Structural Engineering. Minor Field: Structural Mechanics Thesis: Probabilistic Models for Aluminum Microstructure and Intergranular Fracture Analysis. Advisor: Mircea Grigoriu	1999
B.S.E., Civil Engineering & Operations Research <i>summa cum laude</i> Princeton University Thesis: Analysis of the Effect of Differential Support Motion on a Typical Reinforced Concrete Highway Bridge Advisor: George Deodatis	1996

Consulting, Professional Practice and Registration

Flodesign Inc. Wind turbine load analysis	2008 - present
Daedalus Cycles Mechanical testing of bamboo bicycle tube connection details	2007
STX Lacrosse Strength analysis and testing of lacrosse sticks	2006-2008
Engineering Society of Baltimore Strength evaluation of structural roofing material from 19th century building	2004
Intern Engineer Robert Silman Associates, New York City	Summer 1996
EIT New York State	1997

Teaching

University of Massachusetts, Amherst

Perspectives on the Evolution of Structures (CEE211): Great works of structural design for a broad university audience.

Structural Analysis (CEE331): Indeterminate analysis of frames and trusses.

Advanced Solid Mechanics (CEE630): Theory of elasticity, energy methods, elementary plasticity and fracture mechanics.

Finite Element Analysis (CEE605): Introduction to finite element analysis for solid mechanics problems.

Johns Hopkins University

Advanced Structural Analysis (CE445): Matrix methods for linear and nonlinear analysis of trusses and frames.

Structural Mechanics (CE729): Theory of elasticity, energy methods, numerical methods.

Perspectives on the Evolution of Structures (CE141): History of structural design.

Stochastic Micromechanics (CE728): Elements of probability theory, effective material properties, homogenization, material microstructure modeling.

Structural Reliability (CE786): Elements of probability theory, FORM, SORM, load modeling, component and system reliability.

Cornell University (Teaching Assistant)

Structural Behavior: elementary structural analysis and design.

Structural Analysis: Indeterminate analysis of trusses and frames.

Reinforced Concrete Design: Strength based design of reinforced concrete members.

Random Vibrations

Guest lectures in the following courses

The City, A Multidisciplinary Perspective (Johns Hopkins); Introduction to Art History (Fordham); Structural Analysis (Cornell); Structural Reliability (Cornell);

Other teaching related activity

Guest critic at various architecture studios at UMass and the Maryland College Institute of Art; Research practicum advisor, Baltimore Polytechnic Institute.

External Funding and Proposals

Tools for seismic performance-based design and assessment of reinforced concrete coupled wall structures. (\$500,000, co-PI with S. Breña) NIST, **pending**

NEESR-CR: Engineered Cladding Connection Effects on Steel Frame Buildings. (\$877,888, co-PI with S. Civjan, R.K. Mann, and L. McLoughlin) National Science Foundation, **pending**

Modeling the design limit states of structural composite lumber: REU supplement. (\$6,000, co-PI with P.L. Clouston) National Science Foundation, 2009

Modeling the design limit states of structural composite lumber. (\$300,000, co-PI with P.L. Clouston) National Science Foundation, 2009-2011.

Adaptive use of historic truss bridges for civil engineering instruction. (\$149,779, PI with A.J. Lutenecker) National Science Foundation, 2008-2010.

A framework for microstructural design using Bayesian classifiers. (\$287,000, PI with T. Igusa) National Science Foundation, 2004-2007

Internal Funding and Proposals

Preliminary experiments on the structural application of metal foams. (\$30,000, PI) University of Massachusetts, Amherst, Faculty Research Grant, 2008-2009.

An engineer's guide to Baltimore. (\$6,000, co-PI with R. Sangree, graduate student) Johns Hopkins Center for Educational Resources, 2004-2005.

Interactive case studies: Evolution of structures. (\$6,000, co-PI with R. Sangree, graduate student) Johns Hopkins Center for Educational Resources, 2003-2004.

Awards and Honors

Lilly Teaching Fellow, University of Massachusetts, 2008-2009.

NSF New Century Scholar, selected for workshop participation, 2002.

John E. Perry Teaching Assistant Prize. Cornell University, 1997, 1998.

ACI (NJ Section) award for outstanding research in concrete structures, 1996.

Phi Beta Kappa, 1996.

Sigma Xi, 1996.

Tau Beta Pi, 1996.

Research Student Advising

University of Massachusetts, Amherst

Mohammadreza Moradi (Ph.D. 2010 expected); Russell Winans (M.S. 2008); Sean Kelton (M.S. 2009 expected); Patrick Veale (M.S. 2009 expected); John Sullivan (B.S.E. 2011 expected); Randy Machon (B.S.E. 2010 expected); Russell Winans (B.S.E. 2007); Kelly Shanahan (B.S.E. 2010 expected) Allen Sit (B.S.E. 2010 expected); Ryan Mones (B.S.E. 2009); Kara Peterman (B.S. 2009 Swarthmore College).

Johns Hopkins University

Libin Tan (Ph.D. 2008); Arghavan Louhghalam (M.S. 2007); Xiulin Sun (M.C.E. 2005); Mitesh Popat (M.S. 2004); Ying Guan (B.S.E. 2008); Christina Terpeluk (B.S.E. 2006); Liakos Ariston (B.S.E. 2005); Thomas Lydigsen (B.S.E. 2005); Allan Olson (B.S.E. 2006); Annette Tardiff (B.S.E. 2004); Russell Williams (Baltimore Polytechnic Institute, High School).

Graduate Committee Member

University of Massachusetts, Amherst

Stacy Canepari (M.S. 2009, Mechanical Engineering); Jon Lewis (M.S. 2009, Mechanical Engineering); Helena Charron (M.S. 2009 expected); Emre Kalayci (M.S. 2009 expected); Quan Nguyen (M.S. 2009); Ryan Shackleton (Ph.D. 2009, Geosciences); Shuangwen Shen (Ph.D. 2008, Mechanical Engineering); Meltem Duran (M.S. 2009 expected, Mechanical Engineering); Carl Niemitz (M.S. 2007); Michael Mitchell (M.S. 2008); Andrew Jeffrey (M.S. 2007).

Johns Hopkins University

Ryan Braun (Ph.D. 2009 expected, Chemical & Biomolecular Engineering); Mina Seif (Ph.D. 2011 expected); Sun Koo Kim (M.S. 2005); Haoyang Liu (Ph.D. 2004); Zailong Wan (Ph.D. 2004); Dubar Kamara (M.S. 2002).

University Service

University of Massachusetts, Amherst

Departmental liaison to Architecture and Design Program (2008-present); Departmental BS/MS committee (2008-present); Structural Engineering and Mechanics group seminar coordinator (2007-2008); Structural Engineering and Mechanics faculty search committee (2007-present); Dept. scholarship committee (2006-2007); Undergraduate advising (2006-present); Faculty meeting secretary (2007-2008); Dept. Capstone design committee (2007-2008).

Johns Hopkins University

University ethics board juror (2005); Dept. undergraduate curriculum committee (2002-2006); Dept. seminar series coordinator (2003-2004); ASCE student chapter advisor (2004-2006); ASCE steel bridge team faculty advisor (2005) Undergraduate advising (2003-2006); Whiting School of Engineering external relations committee (2005-2006).

Professional Service

Committee membership

ASCE Dynamics (2002-2006); ASCE Probabilistic Methods (2003-present), also chairman of student awards subcommittee (2008-present); IASSAR Computational Mechanics (2003-present); IASSAR Material Modeling (2003-present).

Conference session organization

US National Congress on Computational Mechanics (2009); Int. Conf. on Structural Safety and Reliability (2005, 2009); ASCE Engineering Mechanics Conference (2007, 2008, 2009); ASCE Probabilistic Methods Conference (2004)

Reviewer

National Science Foundation, Civil Mechanical and manufacturing Innovation; National Science Foundation, Undergraduate Education; Modeling and Simulation in Materials Science and Engineering; Cambridge University Press; Engineering Fracture Mechanics; Journal of Wind Engineering and Industrial Aerodynamics; Probabilistic Engineering Mechanics; Journal of Engineering Mechanics; Journal of Bridge Engineering; Journal of Materials in Civil Engineering; Journal of Structural Engineering; AIAA Journal; Computational Materials Science; Computer Methods in Applied Mechanics and Engineering.

Outreach activities

Ingenuity Project at Baltimore Polytechnic Institute, guest lectures on structural engineering and student advising (2002-2005).

Women in Science and Engineering, Johns Hopkins University, presentations on structural engineering (2005).

Guest assistant curator, The George Peabody Library. Bridge Engineering in the Collection of the Peabody Library (2006).

Journal Articles

16. Arwade, S. R., Winans, R., & Clouston, P. L. "Variability of the strength of Parallel Strand Lumber." *Journal of Engineering Mechanics*. (Submitted)
15. Arwade, S. R., & Schafer, B. W. "Cell wall stiffness, geometric uncertainty, and the elastic properties of cellular networks." *Modeling and Simulation in Materials Science and Engineering*. (submitted)
14. Arwade, S. R., Moradi, M., & Louhghalam, A. "Variance decomposition and global sensitivity for structural systems." *Engineering Structures*. (submitted)
13. Arwade, S. R., Winans, R., & Clouston, P. L. "Spatial variation of parallel strand lumber elastic modulus," *Journal of Engineering Mechanics*. (accepted)
12. Dorgan*, K. M., Arwade, S. R., & Jumars, P. A. "Worms as wedges: Effects of sediment mechanics on burrowing behavior." *Journal of Marine Research* 66:219-254 (2008)
11. Arwade, S. R. & Popat*, M. "Statistics of simulated intergranular cracks." *Probabilistic Engineering Mechanics*. 24:117-127 (2009)
10. Louhghalam*, A, & Arwade, S. R. "Prediction of incipient damage sites in composites using classifiers." *International Journal of Damage Mechanics* (Accepted)
9. Tan*, L. & Arwade, S. R. "Response classification of simple polycrystalline microstructures." *Computer Methods in Applied Mechanics and Engineering*. 197:1397-1409 (2008)
8. Dorgan*, K. M., Arwade, S. R., & Jumars, P. A. "Burrowing in marine muds by crack propagation: kinematics and forces." *Journal of Experimental Biology*. 210(23):4198-4212 (2007)
7. Liu*, H., Arwade, S. R., & Igusa, T. "Random composites classification and damage estimation using Bayesian classifiers." *ASCE Journal of Engineering Mechanics*. 133(2):129-140 (2007).
6. Arwade, S. R., Ariston*, L., & Lydigsen*, T. "Structural behavior of the Bollman truss bridge at Savage, Maryland." *Association for Preservation Technology Bulletin*. 37(1):27-36 (2006)
5. Ferrante*, F., Arwade, S. R., & Graham-Brady, L. "A non-stationary translation field model for composite microstructure." *Probabilistic Engineering Mechanics*. 20(3):215-228 (2005).
4. Arwade, S. R. "Translation vectors with non-identically distributed components." *Probabilistic Engineering Mechanics*. 20(2):158-167 (2005).
3. Arwade, S. R., & Grigoriu, M "Characterization and modelling of random polycrystalline microstructures with application to intergranular fracture." *ASCE Journal of Engineering Mechanics*. 130(9):997-1006 (2004)
2. Arwade, S. R. & Grigoriu, M. "The ODF of kinematically determined planar polycrystals subject to random deformation." *Probabilistic Engineering Mechanics*. 18(4):289-299 (2003)
1. Grigoriu, M, Ditlevsen, O. & Arwade, S. R. "A Monte Carlo simulation model for stationary non-Gaussian processes." *Probabilistic Engineering Mechanics*. 18(1): 87-95 (2003).

* student co-author

Chapters in edited volumes

1. Arwade, S. R. "Random microstructural models with application to small scale fracture." In Random Material Microstructures: Modelling and Material Behavior. K. Sobczyk and J. Trebicki eds. Institute of Fundamental Technological Research, Polish Academy of Sciences (2004)

Non-reviewed Journal Publications

1. Graham-Brady, L. L. Arwade, S. R., Corr, D. J., Gutierrez, M. A., Breyse, D., Grigoriu, M., & Zabaras, N. "Probability and materials, from nano- to macro-scale: a summary." *Probabilistic Engineering Mechanics*. 21(3):193-199 (2006).

Conference Proceedings

20. Ferrante, F.J., Brady, L.L.G., Acton*, K., Arwade, S.R. "An overview of micromechanics-based techniques for the analysis of microstructural randomness in functionally graded materials" In Proceedings of the 9th International Conference on Multiscale and Functionally Graded Materials. Paulino, G.H., et al. eds., AIP Proceedings Series, Pp. 190-195, Oahu, HI, October, 2006.
19. Arwade, S. R. "The Sobol decomposition as a tool for dimension reduction as applied to micromechanics problems." In Proceedings of the 18th Engineering Mechanics Conference, ASCE, Blacksburg, VA, June 2007.
18. Louhghalam*, A. & Arwade, S. R. "Prediction of damage initiation in random composite materials using classification." In Proceedings of the 18th Engineering Mechanics Conference, ASCE, Blacksburg, VA, June 2007.
17. Arwade, S. R., Igusa, T., Louhghalam*, A., & Tan*, L. "Reduced order representation, analysis, and design of random material microstructures." In Proceedings of the 2006 NSF-DMI grantees conference, St. Louis, July 2006.
16. Arwade, S. R. "Reduced order descriptors for random composite microstructures." In CSM 06, the proceedings of the 2006 Computational Stochastic Mechanics Conference, Rhodes, Greece, June 2006.
15. Arwade, S. R. & Popat*, M. "Statistics of intergranular cracks in polycrystals." In ICOSSAR 05, the proceedings of the 9th International Conference on Structural Safety and Reliability, Rome, Italy, June 2005.
14. Ferrante*, F. Arwade, S. R. & Graham-Brady, L. L. "Non-Gaussian, non-stationary simulation with spatially varying marginal probability distribution." In ICOSSAR 05, the proceedings of the 9th International Conference on Structural Safety and Reliability, Rome, Italy, June 2005.
13. Arwade, S. R., Popat*, M., & Igusa, T. "Microstructural design using bayesian classifiers: preliminary results on the problem of intergranular fracture." In Proceedings of the NSF-DMI Grantees Conference. Scottsdale, AZ, January 3-6 2005.
12. Arwade, S. R., & Schafer, B. W. "'Perspectives on the Evolution of Structures': Teaching civil engineering history at Johns Hopkins" In Proceedings of the ASCE History and Heritage Committee at the ASCE National Conference and Exposition pp. 332-342 . Baltimore, MD, October 20-23, 2004.
11. Ariston*, L., Lydigsen*, T, & Arwade, S. R. "Structural behavior of the Bollman truss bridge at Savage, Maryland." In Proceedings of the ASCE History and Heritage Committee at the ASCE National Conference and Exposition. pp. 312-331. Baltimore, MD, October 20-23, 2004.
10. Arwade, S. R. "Turning 'Structures and the Urban Environment into 'Perspectives on the Evolution of Structures. In Proceedings of Teaching and Scholarship in the Grand Tradition of Modern Engineering. A symposium held at Princeton University, August 9-23. Published by the Department of Civil and Environmental Engineering, Princeton University, 2004.

9. Arwade, S. R. "Translation vectors with non-identically distributed components." In Proceedings of the 9th ASCE Conference on Probabilistic Methods. Albuquerque, NM, July 26-28, 2004.
8. Schafer, B. W. & Arwade, S. R. "Mechanical properties of random networks." In Proceedings of the 17th ASCE Conference on Engineering Mechanics. Newark, DE, June 13-16, 2004.
7. Arwade, S. R., & Grigoriu, M. "A model for non-stationary and anisotropic polycrystalline microstructures." In Proceedings of the 9th International Conference on Applications of Statistics and Probability in Civil Engineering. Millpress. San Francisco, CA July 2003.
6. Liu*, H., Arwade, S. R. & Igusa, T. "Random composites classification and damage estimation using a classifier model." In Proceedings of the NSF-DMI grantees conference, October, 2003.
5. Liu*, H., Arwade, S. R. & Igusa, T. "Random composites classification and damage estimation using a classifier model." In Proceedings of the 16th ASCE Engineering Mechanics Conference. Seattle, July 2003.
4. Arwade, S. R. & Grigoriu, M. "Stochastic evolution of crystallographic orientation." In Proceedings of the Fourth International Conference on Computational Stochastic Mechanics. Kerkyra (Corfu), Greece. June 9-12, 2002.
3. Arwade, S. R. & Grigoriu, M. "The response of polycrystals to deterministic and random deformation." In ICOSSAR 01, Proceedings of the 8th International Conference on Structural Safety and Reliability. Ed. Johnson, E. A. Newport Beach, CA. June 2001.
2. Arwade, S. R. & Grigoriu, M. "The material state simulator: A prototype." 41st AIAA/ASME/ASCE/ AHS/ASC Structures, Structural Dynamics and Materials Conference. Atlanta, GA. April 1999.
1. Arwade, S. R., Grigoriu, M. & Ingrassia, A. R. "Crack growth in stochastic microstructures." In Stochastic Structural Dynamics, Proceedings of the 4th International Conference on Stochastic Structural Dynamics. Ed: Spencer, B. F. & Johnson, E. A. Notre Dame, IN. August, 1998.

* student co-author

Invited Lectures

5. Arwade, S. R. "Pattern recognition and statistical learning in stochastic mechanics." Stochastic Methods in Mechanics: Status and Challenges. Warsaw, Poland, September 2009.
4. Arwade, S. R. "Characterization of random composites using a classifier model." NSF workshop: Probability and materials, from nano- to macro-scale. Baltimore, MD, January 2005.
3. Arwade, S. R. "Teaching Structures and the Urban Environment at Johns Hopkins University." Teaching and Scholarship in the Grand Tradition of Modern Engineering. A symposium held at Princeton University, August 9-23, 2004.
2. Arwade, S. R. "Random microstructural models with application to small scale fracture. Four lectures given at Random Material Microstructures: Modelling and Mechanical Behavior an advanced course sponsored by the Institute of Fundamental Technological Research of the Polish Academy of Sciences. Warsaw, Poland February 2-4 2004.
1. Arwade, S. R., & Schafer, B. W. "Perspectives on the Evolution of Structures': Teaching civil engineering history at Johns Hopkins" In Proceedings of the ASCE History and Heritage Committee at the ASCE National Conference and Exposition pp. 332-342 . Baltimore, MD, October 20-23, 2004.

Presentations, posters, and Abstracts

18. Arwade, S. R., Clouston, P. L., & Winans, R.* “Measurement and modeling of spatially varying strength in parallel strand lumber.” 10th US National Congress on Computational Mechanics. Columbus, OH, July 2009.
17. Arwade, S. R., & Schafer, B. W. “Cell wall stiffness, geometric uncertainty, and the elastic properties of cellular networks.” The 2009 Joint ASCE-ASME-SES Conference on Mechanics and Materials. Blacksburg, VA, June 2009.
16. Moradi, M.* & Arwade, S. R. “Analysis of uncertainty in structural systems using the Sobol’ decomposition.” First International Conference of the Engineering Mechanics Institute of ASCE. Minneapolis, MN, May 18-21, 2008.
15. Arwade, S. R., & Winans, R.* “Experimental measurement and probabilistic modeling of the spatial variation of Parallel Strand Lumber material properties.” First International Conference of the Engineering Mechanics Institute of ASCE. Minneapolis, MN, May 18-21, 2008.
14. Winans*, R., Arwade, S. R., & Clouston, P. L. “Computational models for the behavior of parallel strand lumber.” Massachusetts undergraduate research conference, Amherst, MA, May, 2007.
13. Tan*, L., & Arwade, S. R. “Local pattern recognition and classification in the linear elastic deformation of two-dimensional polycrystals.” US National Congress on Computational Mechanics, San Francisco, July, 2007.
12. Arwade, S. R., Igusa, T, Tan*, L, & Louhghalam*, A. “Classifier based methods for evaluating localization in heterogeneous materials.” European Conference on Fracture (CFRAC), Nantes, France, June 2007.
11. Dorgan*, K.M., Jumars, P.A., & Arwade, S. “Burrowing in muddy sediments by crack propagation.” Society for Integrative and Comparative Biology 2007 Annual Meeting, Phoenix, AZ. January 3-7, 2007.
10. Louhghalam*, A., Arwade, S. R., & Igusa, T. “Representation of random composite materials using basis functions extracted from principal component analysis.” US National Congress on Theoretical and Computational Mechanics, Boulder, Colorado, July 2006.
9. Tan*, L., Arwade, S. R., & Igusa, T. “Spatial statistics of crystallographic orientations: analysis without the Taylor assumption.” US National Congress on Theoretical and Computational Mechanics, Boulder, Colorado, July 2006.
8. Dorgan*, K. M., Jumars, P. A. & Arwade, S. R. “Burrowing by fracture: Application of fracture models to bioturbation.” Ocean Sciences Meeting, sponsored by AGU/ASLO/TOS, Honolulu, HI, 20-24 February, 2006.
7. Dorgan*, K. M., Jumars, P. A. & Arwade, S. R. “Mechanical constraints on burrowing in marine sediments.” Monod Conference on Marine Biology, Roscoff, France, September 2005.
6. Arwade, S. R., Popat*, M., & Igusa, T. “Microstructural design using bayesian classifiers: preliminary results on the problem of intergranular fracture.” NSF-DMI Grantees Conference. Scottsdale, AZ, January 3-6 2005.
5. Liu*, H., Arwade, S. R. & Igusa, T. “Random composites classification and damage estimation using a classifier model.” NSF-DMI grantees conference, October, 2003.
4. Arwade, S. R. & Schafer, B. W. “Behavior of spatially homogeneous and inhomogeneous random networks.” 7th US National Congress on Computational Mechanics. Albuquerque, NM, August, 2003.
3. Arwade, S. R. & Grigoriu, M. “Effects of uncertainty in loading on crystal plasticity and orientation evolution.” 36th Annual Technical Meeting; The Society for Engineering Science. Austin, TX. October, 1999.

2. Arwade, S. R., Grigoriu, M. Ingrassia, A. R., Miller, M. P., Dawson, P. R., Myers, C. R., Wawrzynek, P. A., & Iesulauro, E. "Probabilistic representation of a polycrystalline microstructure with application to intergranular fracture." Fall meeting of the Materials Research Society. Boston, MA. November 1998.

1. Myers, C. R., Arwade, S. R., Iesulauro, E., Wawrzynek, P. A., Grigoriu, M., Ingrassia, A. R. & Dawson, P. R. "Digital Material: A framework for multiscale modeling of defects in solids." Fall meeting of the Materials Research Society. Boston, MA. November 1998.

* student co-author

Departmental Seminars and Other Lectures

13. Arwade, S. R. "Solving solid mechanics problems without solving solid mechanics problems." Smith College Science and Engineering Seminar Series, October, 2006.

12. Arwade, S. R. "The structural art of Fazlur Khan and Robert Maillart and the place of structure in Baltimore." Structural Engineers Institute of Maryland seminar series, March, 2006.

11. Arwade, S. R. "Approximate methods for solution of micromechanics problems involving uncertainty." Department of Civil and Environmental Engineering, Northeastern University, March 2006.

10. Arwade, S. R. "The development of the Infrastructure of New York City." Department of Environmental Design, Maryland Institute, College of Art, October, 2005.

9. Arwade, S. R. "Rapid prediction of damage patterns in microstructured materials" Department of Civil and Environmental Engineering, University of Delaware. April, 2005

8. Arwade, S. R. "Material evolution and damage at the microscale." Department of Civil, Environmental, and Architectural Engineering, University of Colorado Boulder. March, 2005

7. Arwade, S. R. "New structural forms in new materials." Department of Environmental Design, Maryland Institute, College of Art, October, 2004.

6. Arwade, S. R. "The use of the George Peabody Library in structural engineering research." The George Peabody Library of the Johns Hopkins University, October, 2004.

5. Arwade, S. R. "A framework for microstructural material modeling." Department of Theoretical and Applied Mechanics Seminar. University of Nebraska, March 2004.

4. Arwade, S. R. "Probabilistic research in Materials." Civil Engineering Department Seminar. Howard University, March 2004.

3. Arwade, S. R. "Stochastic characterization and simulation of material microstructures: Aluminum." Invited talk at Sandia National Laboratories, Albuquerque, New Mexico. March 27, 2002

2. Arwade, S. R. "Modeling and Simulation of Polycrystalline Microstructures." Invited talk at Sandia National Laboratories, Albuquerque, New Mexico. November 7, 2002

1. Arwade, S. R. "Simulation of Random Microstructures and Their Fracture." Department seminar. Department of Civil and Environmental Engineering, Cornell University, Ithaca, NY. April 24, 2003.