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CITIZENSHIP US Citizen, by virtue of birth in Redwood City, California, September 7, 1976.

CURRENT POSITION

Mechanical Engineering Chair's Faculty Fellow, Assistant Professor, Department of Mechanical Engineering, University of Colorado at Boulder, Boulder, CO 80309, September 2007-present

PREVIOUS POSITION

Assistant Professor, Department of Civil and Environmental Engineering, Vanderbilt University, Nashville, TN, September 2005-August 2007

EDUCATION

Northwestern University, Evanston, IL

Ph.D. Mechanical Engineering December 2004

Thesis: "*Multiple Scale Methods for the Design and Analysis of Solids*"

Advisor: Professor Wing Kam Liu

M.S. Mechanical Engineering December 2001

Thesis: "*Meshfree Simulations of Dynamic Adiabatic Shearbands*"

Advisor: Professor Wing Kam Liu

B.S. Mechanical Engineering June 1999

INDUSTRIAL EXPERIENCE

Postdoctoral Appointee, Sandia National Laboratories, 09/2004-07/2005

Science-Based Material Modeling Department, Livermore, CA

Manager: Dr. Er-Ping (Tony) Chen

Post-doctoral Advisor: Dr. Jonathan A. Zimmerman

Research Assistant, Engineering Sciences Summer Institute (ESSI), Sandia National Laboratories, Livermore, CA. Summers 1999, 2000, 2001, 2002, 2003

AWARDS

- Woodward Outstanding Mechanical Engineering Faculty Award, 2007-2008
- DARPA Young Faculty Award 2008
- NSF CAREER Award 2007

FELLOWSHIPS

- USACM Young Investigator Travel Fellowship, WCCM 2008, Venice

- SIAM Post-Doctoral Travel Award, Mathematical Aspects of Materials Science Conference 2008, Philadelphia
- ASCE EXCEED Teaching Workshop Fellowship, 2006
- NSF Summer Institute on Nanoscale Mechanics, Bio-inspired Hierarchical Structures, and Potential Applications Fellowship Recipient, 2005
- USNCCM VII Young Investigator Fellowship, 2005
- USACM Student Fellowship for WCCM VI, 2004
- NSF/USACM/ARO Workshop on Computational Nanomechanics of Materials Fellowship Recipient, 2004
- NSF Summer Institute on Multiscale Modeling and Simulation of Nano Mechanics and Materials Fellowship Recipient, 2004
- NSF Summer Institute on Surface Engineering and Coatings Fellowship Recipient, 2003
- NSF-IGERT Fellowship, 2002, 2003, 2004
- USNCCM VI Student Fellowship, 2001
- Nugent Teaching Fellowship, 2001
- Walter P. Murphy Fellowship, 1999, 2000
- Tull Fellowship 1999

PUBLICATION SUMMARY

- 34 refereed journal publications, including articles in *MRS Bulletin*, *Physical Review Letters*, *Nano Letters*, *Applied Physics Letters*, *Physical Review B*, *Nanotechnology*, *Journal of the Mechanics and Physics of Solids*, *Acta Materialia*, *Journal of Applied Physics*, etc.
- 10 invited/special issue journal publications
- 1 book, 5 invited chapters in books
- Guest editor, special issue of *Computer Methods in Applied Mechanics and Engineering* on “Recent Advances in Computational Study of Nanostructures”, 2008.
- Citations: More than 420 as of September, 2008.
- H-Index: 12

REFEREED JOURNAL PUBLICATIONS (Graduate student contribution in red)

1. S. Jun, S. Pendurti, I.-H. Lee, S.Y. Kim, **H.S. Park** and Y.-H. Kim. “Action-Derived *Ab Initio* Molecular Dynamics”, accepted for publication in *Journal of Computational and Theoretical Nanoscience* 2008. (Invited paper: Special Issue on Nanomechanics).
2. S.Y. Kim and **H.S. Park**. “Utilizing Mechanical Strain to Mitigate the Intrinsic Loss Mechanisms in Oscillating Metal Nanowires”, accepted for publication in *Physical Review Letters* 2008.
3. **H.S. Park**, W. Cai, H.D. Espinosa and H. Huang. “Mechanics of Crystalline Nanowires”, accepted for publication in *MRS Bulletin* 2009. (Invited review paper).
4. **H.S. Park** and P.A. Klein. “Surface Stress Effects on the Resonant Properties of Metal Nanowires: The Importance of Finite Deformation Kinematics and the Impact of the Residual Surface Stress”, *Journal of the Mechanics and Physics of Solids* 2008; 56:3144-3166.
5. **H.S. Park**. “Strain Sensing Through the Resonant Properties of Deformed Metal Nanowires”, *Journal of Applied Physics* 2008; 104:013516. (Also selected for publication in the *Virtual Journal of Nanoscale Science and Technology*, July 21, 2008).

6. **H.S. Park**. “Surface Stress Effects on the Resonant Properties of Silicon Nanowires”, *Journal of Applied Physics* 2008; 103:123504. (Also selected for publication in the *Virtual Journal of Nanoscale Science and Technology*, June 30, 2008.)
7. **G. Yun** and **H.S. Park**. “A Multiscale, Finite Deformation Formulation for Surface Stress Effects on the Coupled Thermoelastic Behavior of Nanomaterials”, *Computer Methods in Applied Mechanics and Engineering* 2008; 197:3337-3350. (Invited paper: Special issue on Recent Advances in Computational Study of Nanostructures).
8. **G. Yun** and **H.S. Park**. “A Finite Element Formulation for Nanoscale Resonant Mass Sensing Using the Surface Cauchy-Born Model”, *Computer Methods in Applied Mechanics and Engineering* 2008; 197:3324-3336. (Invited paper: Special issue on Recent Advances in Computational Study of Nanostructures).
9. **H.S. Park** and P.A. Klein. “A Surface Cauchy-Born Model for Silicon Nanostructures”, *Computer Methods in Applied Mechanics and Engineering* 2008; 197:3249-3260. (Invited paper: Special issue on Recent Advances in Computational Study of Nanostructures).
10. D.E. Farrell, **H.S. Park** and W.K. Liu. “Implementation Aspects of the Bridging Scale Method and Application to Interfacial Crack Propagation”, *International Journal for Numerical Methods in Engineering* 2007; 71:583-605.
11. **C. Ji** and **H.S. Park**. “The Coupled Effects of Geometry and Surface Orientation on the Mechanical Properties of Metal Nanowires”, *Nanotechnology* 2007; 18:305704.
12. **H.S. Park** and **V. Laohom**. “Surface Composition Effects on Stress-Induced Martensitic Phase Transformations in Nickel Aluminum Nanowires”, *Philosophical Magazine* 2007; 87:2159-2168. (Invited paper: Special Issue on Nanowires).
13. E.G. Karpov, **H.S. Park** and W.K. Liu. “A Phonon Heat Bath Approach for the Atomistic and Multiscale Simulation of Solids”, *International Journal for Numerical Methods in Engineering* 2007; 70:351-378.
14. **C. Ji** and **H.S. Park**. “On the Role of Defects on the Uniaxial Deformation of Silver Shape Memory Nanowires”, *Journal of Computational and Theoretical Nanoscience* 2007; 4:578-587.
15. Q. Pu, Y. Leng, L. Tsetseris, **H.S. Park**, S.T. Pantelides and P.T. Cummings, “Molecular Dynamics Simulations of Stretched Gold Nanowires – The Relative Utility of Different Semiempirical Potentials”, *Journal of Chemical Physics* 2007; 126:144707.
16. **H.S. Park** and P.A. Klein. “Surface Cauchy-Born Analysis of Surface Stress Effects on Metallic Nanowires”, *Physical Review B* 2007; 75:085408. (Also selected for publication in the *Virtual Journal of Nanoscale Science and Technology*, Feb. 19, 2007.)
17. **C. Ji** and **H.S. Park**. “Characterizing the Elasticity of Hollow Metal Nanowires”, *Nanotechnology* 2007; 18:115707.
18. **C. Ji** and **H.S. Park**. “Geometric Effects on the Inelastic Deformation of Metal Nanowires”, *Applied Physics Letters* 2006; 89:181916. (Also selected for publication in the *Virtual Journal of Nanoscale Science and Technology*, Nov. 13, 2006.)
19. **H.S. Park**, P.A. Klein and G.J. Wagner. “A Surface Cauchy-Born Model for Nanoscale Materials”, *International Journal for Numerical Methods in Engineering* 2006; 68:1072-1095.
20. E.G. Karpov, H. Yu, **H.S. Park**, W.K. Liu, J. Wang and D. Qian. “Multiscale Boundary Conditions in Crystalline Solids: Theory and Application to Nanoindentation”, *International Journal of Solids and Structures* 2006; 43:6359-6379.

21. **H.S. Park**, K. Gall and J.A. Zimmerman. “Deformation of FCC Nanowires by Twinning and Slip”, *Journal of the Mechanics and Physics of Solids* 2006; 54 (9) 1862-1881.
22. **H.S. Park** and **C. Ji**. “On the Thermomechanical Deformation of Silver Shape Memory Nanowires”, *Acta Materialia* 2006; 54 (10):2645-2654.
23. **H.S. Park**. “Stress-Induced Martensitic Phase Transformation in Intermetallic Nickel Aluminum Nanowires”, *Nano Letters* 2006; 6 (5): 958-962.
24. **H.S. Park** and J.A. Zimmerman. “Stable Nanobridge Formation in <110> Gold Nanowires under Tensile Deformation”, *Scripta Materialia* 2006; 54 (6): 1127-1132.
25. W.K. Liu, **H.S. Park**, D. Qian, E.G. Karpov, H. Kadowaki and G.J. Wagner. “Bridging Scale Methods for Nanomechanics and Materials”, *Computer Methods in Applied Mechanics and Engineering* 2006; 195:1407-1421. (Invited paper: Special Issue in Honor of the 60th Birthday of Prof. T.J.R. Hughes).
26. **H.S. Park**, K. Gall and J.A. Zimmerman. “Shape Memory and Pseudoelasticity in Metal Nanowires”, *Physical Review Letters* 2005; 95:255504. (Also selected for publication in the *Virtual Journal of Nanoscale Science and Technology*, Dec. 25, 2005.)
27. **H.S. Park** and J.A. Zimmerman. “Modeling Inelasticity and Failure in Gold Nanowires”, *Physical Review B* 2005; 72:054106.
28. **H.S. Park**, E.G. Karpov, P.A. Klein and W.K.Liu. “Three-Dimensional Bridging Scale Analysis of Dynamic Fracture”, *Journal of Computational Physics* 2005; 207:588-609.
29. **H.S. Park**, E.G. Karpov and W.K. Liu. “Non-reflecting Boundary Conditions for Atomistic, Continuum and Coupled Atomistic/Continuum Simulations”, *International Journal for Numerical Methods in Engineering* 2005; 64:237-259.
30. **H.S. Park**, E.G. Karpov, W.K. Liu and P.A. Klein. “The Bridging Scale for Two-Dimensional Atomistic/Continuum Coupling”, *Philosophical Magazine* 2005; 85 (1): 79-113.
31. **H.S. Park**, E.G. Karpov and W.K. Liu. “A Temperature Equation for Coupled Atomistic/Continuum Simulations”, *Computer Methods in Applied Mechanics and Engineering* 2004; 193: 1713-1732. (Invited paper: Special Issue on Multiple Scale Methods for Nanoscale Mechanics and Materials).
32. **H.S. Park** and W.K. Liu. “An Introduction and Tutorial on Multiple Scale Analysis in Solids”, *Computer Methods in Applied Mechanics and Engineering* 2004; 193: 1733-1772. (Invited paper: Special Issue on Multiple Scale Methods for Nanoscale Mechanics and Materials).
33. W.K. Liu, E.G. Karpov, S. Zhang and **H.S. Park**. “An Introduction to Computational Nano Mechanics and Materials”, *Computer Methods in Applied Mechanics and Engineering* 2004; 193: 1529-1578. (Invited paper: Special Issue on Multiple Scale Methods for Nanoscale Mechanics and Materials).
34. S. Hao, **H.S. Park** and W.K. Liu. “Moving Particle Finite Element Method”, *International Journal for Numerical Methods in Engineering* 2002; 53:1937-1958.

PUBLICATIONS UNDER REVIEW

35. S.Y. Kim, S. Jun and **H.S. Park**. “On the Diffusion of Noble Gas Atoms Through a Graphene Monolayer”, submitted to *Journal of Applied Physics* 2008.
36. **G. Yun** and **H.S. Park**. “Surface Stress Effects on the Bending Properties of Metal Nanowires”, submitted to *Physical Review B* 2008.
37. S.Y. Kim and **H.S. Park**. “The Importance of Edge Effects on the Intrinsic Loss Mechanisms of Graphene Nanoresonators”, submitted to *Nano Letters* 2008.

38. **H.S. Park**. “Quantifying the Size-Dependent Effect of the Residual Surface Stress on the Resonant Frequencies of Silicon Nanowires if Finite Deformation Kinematics are Considered”, submitted to *Journal of Applied Physics* 2008.

BOOKS

1. W.K. Liu, E.G. Karpov and **H.S. Park**. “Nanomechanics and Materials: Theory, Multiple Scale Analysis and Applications”, John Wiley and Sons, ISBN:0-470-01851-8, 2006.

EDITED JOURNAL SPECIAL ISSUES

1. “Recent Advances in Computational Study of Nanostructures”, *Computer Methods in Applied Mechanics and Engineering* 2008; 197:3173-3418 (co-editors J. Fish, H.E. Fang and H. Huang).

INVITED CHAPTERS IN BOOKS

1. **H.S. Park** and P.A. Klein. “Multiscale Models for Surface Effects on Nanomaterials”, Springer Series: Challenges and Advances in Computational Chemistry and Physics, editor Jerzy Leszczynski, Springer 2008.
2. W.K. Liu, **H.S. Park**, E.G. Karpov and D.E. Farrell. “Bridging Scale Method and its Applications”, Meshfree Methods for Partial Differential Equations III, editors M. Griebel and M.A. Schweitzer, Springer 2007, ISBN: 3540462147.
3. W.K. Liu and **H.S. Park**. “Bridging Scale Methods for Computational Nanotechnology”, Handbook of Theoretical and Computational Nanotechnology, editors M. Rieth and W. Schommers, 2006, ISBN: 1-58883-042-X.
4. W.K. Liu, L.T. Zhang, E.G. Karpov, H. Kadowaki and **H.S. Park**. “Bridging Scale Methods”, Springer Lecture Notes in Computational Science and Engineering, editors T. Barth, M. Griebel, D.E. Keyes, R.M. Nieminen, D. Roose and T. Schlick, 2005, ISSN: 1439-7358.
5. W.K. Liu, **H.S. Park**, E.G. Karpov, H. Kadowaki, G.J. Wagner, D. Qian and S. Li. “Bridging Scale Mechanics and Materials”, Finite Element Methods: 1970’s and Beyond – A book dedicated to Thomas J.R. Hughes, editors L.P. Franca, T.E. Tezduyar and A. Masud. International Center for Numerical Methods and Engineering (CINME), ISBN: 84-95999-49-8, 72-88 2004.

INVITED CONFERENCE PUBLICATIONS

1. **H.S. Park** and P.A. Klein. “Boundary Condition and Surface Stress Effects on the Resonant Frequencies of Metal Nanowires”, 2nd International Conference on Heterogeneous Materials Mechanics, China, June 2008.

INVITED UNIVERSITY OR NATIONAL LABORATORY OR FUNDING AGENCY PRESENTATIONS

1. **H.S. Park**. University of Arkansas (Little Rock), Spring 2009.
2. **H.S. Park**. University of Illinois at Chicago, Spring 2009.
3. **H.S. Park**. “Surface Stress Effects on the Resonant Properties of Metal Nanowires: The Importance of Finite Deformation Kinematics and the Impact of the Residual Surface Stress.” Northwestern University, October 2008.
4. **H.S. Park**. “Surface Effects on the Elastic and Inelastic Behavior and Properties of Nanomaterials”, NIST, Boulder, March 2008.
5. **H.S. Park** and M.L. Dunn. “FEM for Nanoresonators”, iMint Center IAB Meeting, Boulder, March 2008.

6. **H.S. Park.** “Modeling Surface Effects on the Behavior and Properties of Nanomaterials”, University of Wyoming, Laramie, February 2008.
7. **H.S. Park.** “Modeling Surface Effects on the Behavior and Properties of Nanomaterials”, Army Research Laboratories, Aberdeen, January 2008.
8. **H.S. Park.** “Issues in CAE (FEM)-Based Design of Surface-Dominated NEMS”, DARPA MTO Workshop on N/MEMS Design Automation, San Diego, December 2007.
9. **H.S. Park.** “Atomistic and Multiscale Modeling of Nanomaterials”, Korea Advanced Institute of Science and Technology (KAIST), December 2006.
10. **H.S. Park.** “Atomistic and Multiscale Modeling of Nanomaterials”, Seoul National University (Korea), December 2006.
11. **H.S. Park.** “Atomistic and Multiscale Modeling of Nanomaterials”, Samsung Advanced Institute of Technology (Korea), December 2006.
12. **H.S. Park.** “Surface Effects on the Mechanical Behavior of Nanomaterials”, University of California at Berkeley, October 2006
13. E.G. Karpov, D. Qian, **H.S. Park** and W.K. Liu. “Bridging Scale and Domain Reduction Approaches to Multiscale Computations”, AtC Coupling Methods Workshop, Sandia National Laboratories, March 2006.
14. **H.S. Park.** “Atomistic and Multiple Scale Modeling of Nanoscale Materials”, Oak Ridge National Laboratories, January 2006.
15. **H.S. Park.** “Concurrent and Hierarchical Multiscale Modeling of Solids”, Georgia Institute of Technology, January 2006.
16. **H.S. Park.** “Modeling and Simulation of Nanoscale Materials”, Florida International University, November 2005.

INVITED CONFERENCE PRESENTATIONS

1. **H.S. Park** and P.A. Klein. “Surface Stress Effects on the Resonant Properties of Metal Nanowires: The Importance of Finite Deformation Kinematics and the Impact of the Residual Surface Stress”, 2nd International Conference on Heterogeneous Materials Mechanics, China, June 2008.
2. **H.S. Park** and P.A. Klein. “Surface Stress Effects on the Resonant Properties of Metal Nanowires: The Importance of Finite Deformation Kinematics and the Impact of the Residual Surface Stress”, SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, May 2008.
3. **H.S. Park**, P.A. Klein and G. Yun. “Multiscale Models to Capture Surface Stress Effects on Metallic and Semiconducting Nanowires”, Workshop on Low-Dimensional Semiconducting Nanostructures, Banff, Canada, November 2007.
4. **H.S. Park**, P.A. Klein and G. Yun. “Resonant-Based Mass and Strain Sensing Using Metal Nanowires”, Thin Air Philosophical Society Symposium, Boulder, August 2007.
5. **H.S. Park** and G. Yun. “Surface Cauchy-Born Modeling of Nanoscale Resonant Mass Sensing”, USNCCM VIII, San Francisco, July 2007.
6. **H.S. Park**, P.A. Klein and G.J. Wagner. “A Surface Cauchy-Born Model for Nanoscale Materials”, SES 2006, Penn State, August 2006.
7. **H.S. Park**, P.A. Klein and G.J. Wagner. “A Surface Cauchy-Born Model for Nanoscale Materials”, WCCM VII, Los Angeles, July 2006.
8. **H.S. Park.** “Multiple Scale Methods for Solid Mechanics”, Workshop on Multiscale Modeling in Solids, Centre de Recherches Mathematiques, Toronto, April 2005.
9. **H.S. Park**, E.G. Karpov, P.A. Klein and W.K. Liu. “Atomistic/Continuum Coupling using the Bridging Scale”, (Keynote Lecture), WCCM VI, Beijing, September 2004.

GRADUATE STUDENTS ADVISED

- Xiaohu Qian
- Shuangxing Dai (co-advised with M.L. Dunn)
- Geng Yun (Ph.D. expected July 2010) – “Instability Analysis of Surface-Dominated Nanomaterials”
- Benjamin Ude (MS completed July 2008)
- Changjiang Ji (Ph.D. completed August 2007) – “Surface Effects on the Mechanical Properties of Metal Nanowires”
- Veda Laohom (MS Completed May 2007) – “Computational Characterization of Novel Engineering Materials”. Co-advisor: Caglar Oskay, Vanderbilt University.

POST-DOCTORAL RESEARCHERS ADVISED (University of Colorado)

- Dr. Sung Youb Kim (Jan 2008-May 2009)

UNDERGRADUATE STUDENTS ADVISED (University of Colorado)

- Mr. Chandra Kunapuli, summer 2008, funded by NSF REU/NSF Career Award
- Mr. Steven Koenig, summer 2008, funded by NSF REU/NSF Career Award

DISSERTATION COMMITTEES SERVED (University of Colorado)

- Dissertation Committee Member: Sheng-Kai Yu (Civil Engineering) 2008, Sara Olesiak (Mechanical Engineering) 2008, Keith W. Jones (Mechanical Engineering) 2008.

DISSERTATION COMMITTEES SERVED (Vanderbilt University)

- Dissertation Committee Member: Honggang Zhao (Chemical Engineering) 2005, Qing Pu (Chemical Engineering) 2006, Barron Bichon (Civil Engineering) 2006

FUNDED RESEARCH

- **H.S. Park** (PI). Research Experience for Undergraduates (REU), NSF 2/08/2008, \$6000.
- **H.S. Park** (PI). Novel Multiscale CAE Tools for Surface-Dominated NEMS, \$150,000, DARPA Young Faculty Award, 5/1/08-10/31/09.
- **H.S. Park** (PI). Multiscale Design of the Coupled Optomechanical Properties of Silicon Nanowires, \$400,250, NSF CAREER Award, 8/1/07-7/31/12.
- **H.S. Park** (Co-PI) and M.L. Dunn (Co-PI). Multiscale Modeling Tools for Nanostructure Surface/Interface Effects and Application to Nanowire-Based Resonant Mass Sensing”, \$50,000, DARPA iMINT Seed Money Grant, 5/1/07-4/30/08.
- **H.S. Park** (PI). Investigating the Thermomechanical Behavior of Shape Memory Metal Nanowires, \$32,971, Vanderbilt University Discovery Grant, 5/1/06-6/30/08.

EXTERNAL SERVICE

- ASME Applied Mechanics Division Committee on Computing in Applied Mechanics (Member, 2007-present)
- iMechanica Journal Club editor, “Surface Effects on Nanomaterials”, November 2007
- NSF Unsolicited Proposal Panel Reviewer 2008 (Materials Transformation and Mechanics)
- NSF CAREER Award Panel Reviewer 2005, 2007 (Materials Transformation and Mechanics)

- Advisory Board, 7th World Congress on Computational Mechanics, 2006

JOURNAL REVIEWER

- Physical Review Letters, Physical Review B, Computer Methods in Applied Mechanics and Engineering, Nanotechnology, International Journal of Solids and Structures, International Journal for Numerical Methods in Engineering, Journal of the Mechanics and Physics of Solids, International Journal for Multiscale Computational Engineering, Materials Research Society Symposium Proceedings, Modelling and Simulation in Materials Science and Engineering, Philosophical Magazine, Journal of Nanoscience and Nanotechnology, Computational Materials Science, Molecular Simulation, Computational Mechanics, ASME Conference Proceedings, Chemical Physics Letters, Thin Solid Films, Physica B: Condensed Matter, Nano Letters, Journal of Applied Physics, Applied Physics Letters, Journal of Nanomaterials, ASME Journal of Applied Mechanics, Acta Materialia, Journal of the American Chemical Society

ORGANIZED MINISYMPOSIA

- Recent Advances in the Computational Study of Nanostructures (with H. E. Fang and G. Odegard), USNCCM 2009
- Recent Advances in the Computational Study of Nanostructures (with H. E. Fang and G. Odegard), IMECE 2008
- Multiscale Modeling and Simulation of Nanocomposites (with H. Jiang and G. Li), USNCCM IX 2007, San Francisco
- Modeling and Simulation of Nanoscale Materials and Devices (with T. Belytschko and S. Xiao), USNCCM IX 2007, San Francisco.
- Multiscale Modeling and Simulation of Materials (with W.K. Liu and L. Zhang), McMat 2005, Baton Rouge.
- Recent Advances in Computational Modeling of Nanostructures (with H. Huang, E. Fang and J. Fish), WCCM VII 2006, Los Angeles.