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EDUCATION

PhD , Materials Science & Engineering Arizona State University, Tempe, AZ, USA	2011-2015 (GPA 4.0/4.0)
Bachelors of Technology, Metallurgical and Materials Engineering Indian Institute of Technology (IIT) Kharagpur, India	2004-2008 (GPA 9.02/10) Department rank : 1

PROFESSIONAL EXPERIENCE

Indian Institute of Technology Kanpur, India Assistant Professor, Materials Science and Engineering	(Dec, 2015 - Present)
Arizona State University, Tempe, USA Postdoctoral Research Associate	(Aug, 2015 - Dec, 2015)
Arizona State University, Tempe, USA Graduate Research Assistant	(Aug, 2011 - Aug, 2015)
Tata Steel, Jamshedpur, India Manager, Operation, Hot Strip Mill (HSM) (July, 2010 - June, 2011) Total Quality Management (TQM) Executive (March, 2010 - June, 2010) Safety Executive (Nov, 2009 - Feb, 2010) Project Executive (July, 2009 - Oct, 2009) Management Trainee Technical (July, 2008 - June, 2009)	(July, 2008 - June, 2011)
University of British Columbia, Vancouver, Canada Undergraduate Research Student	(May, 2007 - July 2007)

RESEARCH PUBLICATIONS

Journal Articles: 53, Book Chapter: 1, Conference Proceedings: 4, Industrial Reports: 2, Conference Presentations: 68

Journal Articles: Published (53)

1. R. Sarvesha, A. Gokhale, K. Kumar, N. K. Sharma, J. Jain, **S. S. Singh**, Effect of crystal orientation on indentation-induced deformation behavior of zinc, *Materials Science and Engineering: A*, 776 (2020) 139064
2. R. Sarvesha, Y. L. Chiu, I. P. Jones, **S. S. Singh**, J. Jain, Mechanical property evaluation of second phase particles in a Mg-8Al-0.5 Zn alloy using micropillar compression, *Materials Science and*

Engineering: A, 775 (2020) 138973.

3. N. Ansari, B. Tran, W. J. Poole, **S. S. Singh**, K. Hariharan, J. Jain, High temperature deformation behavior of Mg-5wt.% Y binary alloy: Constitutive analysis and processing maps, *Materials Science and Engineering: A*, 777 (2020) 139051
4. A. S. S. Singaravelu, J. J. Williams, H. D. Goyal, S. Niverty, **S. S. Singh**, T. J. Stannard, X. Xiao, N. Chawla, 3D time-resolved observations of fatigue crack initiation and growth from corrosion pits in Al 7XXX alloys using in situ synchrotron x-ray tomography, *Metallurgical and Materials Transactions A* 51 (1) (2020) 28-41
5. K. Kadali, D. Dubey, Sarvesha R, H. Kancharla, J. Jain, K. Mondal, **S. S. Singh**, Dissolution kinetics of Mg₁₇Al₁₂ eutectic phase and its effect on corrosion behavior of as-cast AZ80 magnesium alloy, *JOM*, 71 (2019) 2209-2218.
6. Sarvesha R, W. Alam, A. Gokhale, Guruprasad, S. Bhagavath, S. Karagadde, J. Jain, **S. S. Singh**, Quantitative assessment of second phase particles characteristics and its role on the deformation response of a Mg-8Al-0.5Zn alloy, *Materials Science and Engineering A*, 759 (2019) 368-379.
7. A. Gokhale, Sarvesha R, E-W Huang, S. Y. Lee, R. Prasad, **S. S. Singh**, J. Jain, Quantitative evaluation of grain boundary sliding and its dependence on orientation and temperature in pure Zn, *Materials Letters*, 246 (2019) 24-27.
8. A. Gokhale, Sarvesha R, R. Prasad, **S. S. Singh**, J. Jain, A novel approach to refine surface grains in pure Zinc using indentation scratch, *Materials Letters*, 247 (2019) 151-154.
9. R. Sonkusare, A. Swain, M. R. Rahul, S. Samal, N. P. Gurao, K. Biswas, **S. S. Singh**, N. Nayan, Establishing processing-microstructure-property paradigm in complex concentrated equiatomic CoCuFeMnNi alloy, *MSEA*, 759 (2019) 415-429.
10. S. Singh, H. Li, **S. S. Singh**, J. Williams, T. Stannard, X. Xiao, Y. Jiao, N. Chawla, Microstructural characterization and mechanical property prediction of a polymer matrix composite by X-ray synchrotron tomography and spatial correlation functions, *SN Applied Sciences*, 1 (10) (2019) 1302
11. Gaurav, Sarvesha R, **S. S. Singh**, J. Jain, R. Prasad, Study of static recrystallization behavior of a Mg-6Al-3Sn alloy, *Journal of Materials Engineering and Performance*, 28 (2019) 3468-3477
12. A. Gokhale, Sarvesha R, R. Prasad, **S. S. Singh**, J. Jain, Effect of grain orientation on indentation induced creep in pure zinc, *Journal of Engineering Materials and Technology*, 141(4) (2019) 041014-1:6
13. T. J. Stannard, J. J. Williams, **S. S. Singh**, A. S. S. Singaravelu, X. Xiao, N. Chawla, 3D time-resolved observations of corrosion and corrosion-fatigue crack initiation and growth in peak-aged Al 7075 using synchrotron X-ray tomography, *Corrosion Science*, 138 (2018) 340-352.
14. A. Zindal, J. Jain, R. Prasad, **S. S. Singh**, R. Sarvesha, P. Cizek, M. R. Barnett, Effect of heat treatment variables on the formation of precipitate free zones (PFZs) in Mg-8Al-0.5 Zn alloy, *Materials Characterization*, 136 (2018) 175-182.
15. C. S. Kaira, V. De Andrade, **S. S. Singh**, C. Kantzos, A. Kirubanandham, F. De Carlo, N. Chawla, Probing novel microstructural evolution mechanisms in aluminum alloys using four-dimensional nanoscale characterization, *Advanced Materials*, 29 (41) (2017).
16. **S. S. Singh**, T. J. Stannard, X. Xiao, N. Chawla, *In Situ* X-ray microtomography of stress corrosion cracking and corrosion-fatigue in aluminum alloys, *JOM*, 69 (2017) 1404-1414.
17. A. Zindal, J. Jain, R. Prasad, **S. S. Singh**, P. Cizek, Correlation of grain boundary precipitate characteristics with fracture and fracture toughness in an Mg-8Al-0.5Zn alloy, *Materials Science and Engineering A*, 706 (2017) 192-200.
18. C. S. Kaira, V. De Andrade, **S. S. Singh**, C. Kantzos, A. Kirubanandham, F. De Carlo, N. Chawla, Understanding nanoscale 4D microstructural evolution in aluminum alloys using transmission X-ray microscopy (TXM), *Microscopy and Microanalysis*, 23 (2017) 2220-2221.

19. R. Vallabhaneni, E. Ezadi, C. R. Mayer, C. S. Kaira, **S. S. Singh**, J. Rajagopalan, N. Chawla, In situ tensile testing of tin (Sn) whiskers in a Focused Ion Beam (FIB)/Scanning Electron Microscope (SEM), *Microelectronics Reliability*, 79 (2017) 314-320.
20. X. Wang, **S. S. Singh**, T. Ma, C. Lv, N. Chawla, H. Jiang, Quantifying electrochemistry reactions and properties of amorphous silicon in a conventional lithium-ion battery configuration, *Chemistry of Materials*, 29 (2017) 5831-5840.
21. S. Chakravarty, K. Sikdar, **S. S. Singh**, D. Roy, C. C. Koch, Grain size stabilization and strengthening of cryomilled nanostructured Cu-12at. % Al alloy, *Journal of Alloys and Compounds*, 716 (2017) 197-203.
22. A. Zindal, J. Jain, R. Prasad, **S. S. Singh**, Effect of pre-strain and grain size on the evolution of precipitate free zones (PFZs) in a Mg-8Al-0.5Zn alloy, 201 (2017) 207-210.
23. E. Guo, **S. S. Singh**, C. Mayer, X. Meng, Y. Xu, L. Luo, M. Wang, N. Chawla, Effect of Gallium addition on the microstructure and micromechanical properties of constituents in Nb-Si based alloys, *Journal of Alloys and Compounds* 704 (2017) 89-100.
24. S. Jain, A. Gokhale, J. Jain, **S. S. Singh**, K. Hariharan, Fatigue behavior of aged and solution treated AZ61 Mg alloy at small length scale using nanoindentation, *Materials Science and Engineering: A*, 684 (2017) 652-659.
25. E. Guo, **S. S. Singh**, C. S. Kaira, X. Meng, Y. Xu, L. Luo, M. Wang, N. Chawla, Mechanical properties of microconstituents in Nb-Si-Ti alloy by micropillar compression and nanoindentation, *Materials Science and Engineering A*, 687 (2017) 99-106.
26. R. Yuan, **S. S. Singh**, N. Chawla, J. Oswald, Geometry segmentation of voxelized representations of heterogeneous microstructures using betweenness centrality, *Materials Characterization*, 118 (2016) 553-559.
27. C. S. Kaira, **S. S. Singh**, A. Kirubanandham, N. Chawla, Microscale behavior behavior of bicrystal boundaries in pure tin (Sn) using micropillar compression, *Acta Materialia*, 120 (2016) 56-67.
28. **S. S. Singh**, J. J. Loza, A. P. Merkle, N. Chawla, Three dimensional microstructural characterization of nanoscale precipitates in AA7075-T651 by Focused Ion Beam (FIB) Tomography, *Materials Characterization*, 118 (2016) 102-111.
29. **S. S. Singh**, J. J. Williams, T. Stannard, X. Xiao, F. De Carlo, N. Chawla, Measurement of localized corrosion rates at inclusion particles in AA7075 by *in situ* three dimensional (3D) X-ray synchrotron tomography, *Corrosion Science*, 104 (2016) 330-335.
30. **S. S. Singh**, M. A. Jansen, N. M. Franz, N. Chawla, Microstructure and nanoindentation of the rostrum of *Curculio longinasus* Chittenden, 1927 (Coleoptera: Curculionidae), *Materials Characterization*, 118 (2016) 206-211.
31. T. Lai, **S. S. Singh**, A. S. S. Singaravelu, K. S. Vadari, N. Chawla, M. L. Lind, Hydrogen permeability and mechanical properties of NiNb-X(X=Sn,Ti and Zr) amorphous metallic membranes, *Journal of Alloys and Compounds*, 684 (2016) 359-365.
32. C. Mayer, Y. Lingwei, **S. S. Singh**, J. Molina-Aldareguia, Y. L. Shen, N. Chawla, Anisotropy, size and aspect ratio effects in micropillar compression of Al-SiC nanolaminate composites, *Acta Materialia*, 168 (2016) 129-133.
33. M.A. Jansen, **S. S. Singh**, N.M. Franz, N. Chawla, A multilayer micromechanical model of the cuticle of *Curculio longinasus* Chittenden, 1927 (Coleoptera: Curculionidae), *Journal of Structural Biology*, 195 (2016) 139-158.
34. S. Das, A. Maroli, **S. S. Singh**, T. Stannard, X. Xiao, N. Chawla, N. Neithalath, A microstructure-guided constitutive modeling approach for random heterogeneous materials: application to structural binders, *Computational Materials Science*, 119 (2016) 52-64.
35. C. Mayer, Y. Lingwei, **S. S. Singh**, H. Xie, Y.L. Shen, J. Llorca, J. Molina-Aldareguia, N. Chawla.

- Orientation Dependence of Indentation Behavior in Al-SiC Nanolaminate Composites, *Materials Letters*, 168 (2016) 129-133.
36. **S. S. Singh**, E. Guo, H. Xie, N. Chawla, Mechanical properties of intermetallic inclusions in Al 7075 alloys by micropillar compression, *Intermetallics*, 62 (2015) 69-75.
 37. B. M. Patterson, N. L. Cordes, K. Henderson, J. J. Williams, T. Stannard, **S. S. Singh**, A. Rodriguez Ovejero, X. Xiao, M. Robinson, N. Chawla, *In situ* X-ray Synchrotron Tomographic Imaging during the Compression of Hyperelastic Polymeric Materials, *Journal of Materials Science*, 51 (2016) 171-187. (cover image) (50th Anniversary Issue; also finalist for 2016 Cahn Prize).
 38. S. Das, P. Yang, **S. S. Singh**, J. Mertens, X. Xiao, N. Chawla, N. Neithalath, Effective properties of a fly ash geopolymer: synergistic application of x-ray synchrotron tomography, nanoindentation, and homogenization models, *Cement and Concrete Research*, 78 (2015) 252-262.
 39. **S. S. Singh**, J. J. Williams, M. Lin, X. Xiao, F. De Carlo, N. Chawla, *In Situ* investigation of high humidity stress corrosion cracking of 7075 aluminum alloy by three-dimensional (3D) X-ray synchrotron tomography, *Materials Research Letters*, 2 (4) (2014) 217-220.
 40. **S. S. Singh**, C. Schwartztein, J. J. Williams, X. Xiao, F. De Carlo, N. Chawla, 3D microstructural characterization and mechanical properties of constituents particles in Al7075 alloys using x-ray synchrotron tomography and nanoindentation, *Journal of Alloys and Compounds*, 602(2014)163-174.
 41. **S. S. Singh**, J. J. Williams, P. Hruby, X. Xiao, F. De Carlo, N. Chawla, *In situ* experimental techniques to study the mechanical behavior of materials using x-ray synchrotron tomography, *Integrating Materials and Manufacturing Innovation*, (2014) 3-9.
 42. **S. S. Singh**, R. Sarkar, H. Xie, C. Mayer, J. Rajagopalan, N. Chawla, Tensile behavior of single crystal tin whiskers, *Journal of Electronic Materials*, 43 (2014) 978-982.
 43. P. Hruby, **S. S. Singh**, J. J. Williams, X. Xiao, F. De Carlo, N. Chawla, Fatigue crack growth in SiC particle reinforced Al alloy matrix composites at high and low R-ratios by *in situ* x-ray synchrotron tomography, *International Journal of Fatigue*, 68 (2014) 136-143.
 44. R. Yuan, **S. S. Singh**, N. Chawla, J. Oswald, Efficient methods for implicit geometrical representation of complex material microstructures, *International Journal for Numerical Methods in Engineering*, 98 (2014) 79-91.
 45. E. Guo, H. Xie, **S. S. Singh**, A. Kirubanandham, T. Jing, N. Chawla, Mechanical characterization of microconstituents in a cast duplex stainless steel by micropillar compression, *Materials Science and Engineering A*, 598 (2014) 98-105.
 46. E. Guo, **S. S. Singh**, H. Xie, J. J. Williams, T. Jing, N. Chawla, Microstructure-based modeling of deformation in steels based on constitutive relationships from micropillar compression, *Steel Research International*, 85 (2014) 946-953.
 47. A. P. Merkle, L. Lechner, A. Steinbach, J. Gelb, M. Kienle, M. W. Phaneuf, D. Unrau, **S. S. Singh**, N. Chawla, Automated correlative tomography using XRM and FIB-SEM to span length scales and modalities in 3D materials, *Microscopy and Analysis*, 28 (7) (2014) S10-S13.
 48. T. D. Prichard, **S. S. Singh**, N. Chawla, B. D. Vogt, Flocculated carbon nanotube composites for solvent resistant soft templated microfeatures, *Polymer*, 54 (2013) 1130-1135.
 49. **S. S. Singh**, J. J. Williams, Y. Jiao, N. Chawla, Modeling anisotropic multiphase heterogeneous materials via directional correlation functions: Simulations and experimental verification, *Metallurgical and Materials Transactions A*, 43 (2012) 4470-4474.
 50. D. Roy, R. Mitra, O. A. Ojo, **S. S. Singh**, D. Kolesnikov, W. Lojkowski, R. O. Scattergood, C. C. Koch, I. Manna, Evaluation of mechanical properties of partially amorphous and nanocrystalline Al₅₀Ti₄₀Si₁₀ composites prepared by mechanical alloying and hot isostatic pressing, *Materials Science and Engineering A*, 555 (2012) 21-27.
 51. **S. S. Singh**, D. Roy, R. Mitra, R. V. Subba Rao, R. K. Dayal, Baldev Raj, I. Manna, Studies on laser

sintering of mechanically alloyed Al₅₀Ti₄₀Si₁₀ composite, *Materials Science and Engineering A*, 501 (2009) 242-247.

52. D. Roy, **S. S. Singh**, B. Basu, W. Lojkowski, R. Mitra, I. Manna, Studies on wear behavior of nano-intermetallic reinforced Al-base amorphous/nanocrystalline matrix *in-situ* composite, *Wear*, 266 (2009) 1113-1118.
53. D. Roy, **S. S. Singh**, R. Mitra, M. Rosiński, A. Michalski, W. Łojkowski, I. Manna, Synthesis and characterization of precipitation hardened amorphous matrix composite by mechanical alloying and pulse plasma sintering of Al₆₅Cu₂₀Ti₁₅, *Philosophical Magazine*, 89 (2009) 1051-1061.

Book Chapter (1)

1. **S. S. Singh** and N. Chawla, 3D/4D X-ray Tomography: Probing the mechanical properties of materials, *Handbook of Mechanics of Materials* (Springer), 1-21 (2018).

Conference Proceedings (4)

1. **S. S. Singh**, R. Yuan, J. Oswald, N. Chawla, Damage evolution in Al-SiC composites by X-ray synchrotron tomography and extended finite element modeling (X-FEM), 20th International Conference on Composite Materials (ICCM20), Copenhagen, Denmark, (2015).
2. S. Das, P. Yang, **S.S. Singh**, N. Chawla, and N. Neithalath, Microstructure-based modeling of effective properties of fly ash-based geopolymers, Proceedings of the 2nd International ACI India Chapter conference on Advances in Concrete, Mumbai, (2015).
3. **S. S. Singh**, J. J. Williams, P. Hruby, J. C. E. Mertens, A. Kirubanandham, N. Chawla, X. Xiao, F. De Carlo, Image analysis of time-evolved x-ray microtomography data sets using Avizo Fire, Americas Amira-Avizo user group Meeting (AAAUGM), (2014).
4. **S. S. Singh**, J. J. Williams, X. Xiao, F. De Carlo, N. Chawla, *In situ* three dimensional (3D) x-ray synchrotron tomography of corrosion fatigue in Al7075 alloy, *Fatigue of Materials II: Advances and Emergences in Understanding*, (2012) 17-25.

Industrial Reports (2)

1. **S. S. Singh**, T. K. Roy, P. K. Pandey, J. Chakraborty, V. V. Mahashabe and T. Venugopalan, A study on establishing centerline porosity index and effect of casting parameters in continuously cast billets, *Tata Search*, 2 (2010) 269-272.
2. J. Chakraborty, P. N. Choubey, D. K. Singh, **S. S. Singh**, T. Venugopalan, Studies on correlation of rim thickness of TMT re-bars with mechanical properties, *Tata Search*, 2 (2010) 333-336.

Conference Presentations (68)

1. P. Setia, R. Sarvesha, A. Gokhale, T. Tharrian, T. Venkateswaran, **S. S. Singh**, S. Shekhar, Microstructural and Mechanical Characterization of Cast Austenitic Stainless Steel Alloyed with Si TMS, San Diego (2020)
2. S. Bajpai, **S. S. Singh**, K. Balani, Effect of B₄C addition on (Hf,Zr)B₂ based Ultra high temperature ceramics, TMS, San Diego (2020)
3. A. Sundar, J. Williams, H. Goyal, S. Niverty, **S. S. Singh**, T. Stannard, X. Xiao, N. Chawla, In-situ X-ray Microtomography to Elucidate Corrosion-fatigue Mechanisms in Aluminum Alloys TMS, San Diego (2020)

4. Sarvesha R, W. Alam, A. Gokhale, Guruprasad T, S. Bhagavath, S. Karagadde, J. Jain, **S. S. Singh**, Effect of Second Phase Particles on the Mechanical behavior of AZ80 Magnesium Alloy, MRSI, Bangalore, India (2019) (**Invited**)
5. A. Kumar, N. Kumar, Sarvesha R, K. Biswas, **S. S. Singh**, Processing and Characterization of Lanthana Based ODS Steel for Nuclear Reactor Applications, ISMANAM 2019, Chennai, India (2019) (Poster)
6. A. Kumar, N. Kumar, K. Biswas, **S. S. Singh**, Processing and Characterization of 14YWT ODS steel, ICAMPS 2018, Trivandram, India (2018) (Poster)
7. K. Kadali, D. Dubey, Sarvesha R, K. Hari Krishna, J. Jain, K. Mondal, **S. S. Singh**, Effect of solutionization on corrosion behaviour of as-cast AZ80 Mg alloy, NMD-ATM 2018, Kolkata, India (2018) (Poster)
8. D. Dubey, K. Kadali, **S. S. Singh**, K. Mondal, J. Jain, Effect of aging on the corrosion behaviour of AZ80 Magnesium alloy in 3.5% NaCl solution' NMD-ATM 2018, Kolkata, India (2018) (Poster)
9. A. Kumar, N. Kumar, Sarvesha R, K. Biswas, **S. S. Singh**, Processing and Characterization of 14YWT and 14LWT ODS steel: A Comparative Study, NMD-ATM 2018, Kolkata, India (2018) (Poster)
10. P. Setia, A. Anand, A. Kumar, **S. S. Singh**, S. Shekhar, K. Mondal, T. Venkateswaran, S. T. Tharrian, Effect of Heat-treatment on the Microstructure Evolution of High-Silicon Stainless Steel, ICAMPS 2018, Trivandrum, India (2018) (Poster)
11. P. Setia, S. Shekhar, **S. S. Singh**, T. Venkateswaran, S. T. Tharrian, Microstructural evolution of high silicon stainless steel, NMD-ATM 2018, Kolkata, India (2018) (Poster)
12. S. S. Panda, D. Dubey, J. Jain, **S. S. Singh**, Effect of Aging treatment on the Fatigue Behavior of As Cast AZ80 Magnesium Alloy, NMD-ATM 2018, Kolkata, India (2018) (Poster)
13. A. K. Gupta, Sarvesha R, A. Kumar, G. Telasang, G. Padmanabham, I. Manna, **S. S. Singh**, Laser Processing of Ni-Cr alloys, NMD-ATM 2017, Goa, India (2017) (Short Presentation)
14. Sarvesha R, A. Gokhale, J. Jain, **S. S. Singh**, Microscale study of Magnesium Alloy AZ80, NMD-ATM 2017, Goa, India (2017) (Poster)
15. **S. S. Singh**, N. Chawla, X. Xiao, Understanding deformation behavior of materials by in situ X-ray synchrotron tomography, IUMRS International Conference in Asia, Taipei, Taiwan (2017) (**Invited**)
16. **S. S. Singh**, N. Chawla, X. Xiao, In situ synchrotron tomography to understand deformation behavior of materials, Theme meeting on X-ray micro-imaging using synchrotron radiation and its application, RRCAT, Indore, India (2017) (Invited)
17. C. S. Kaira, V. De Andrade, **S. S. Singh**, C. Kantzos, F. De Carlo, N. Chawla, Probing 4D Microstructural Evolution in Aluminum alloys using Transmission X-Ray Microscopy (TXM), 3rd International Conference on Tomography of Materials and Structures (ICTMS2017), Lund, Sweden
18. **S. S. Singh**, N. Chawla, X. Xiao, 4D materials science: understanding deformation behavior using in situ X-ray tomography, International Conference of Young Researchers on Advanced Materials (ICYRAM), Bangalore, India, (2016) (Invited)
19. C. S. Kaira, **S. S. Singh**, C. Kantzos, A. Kirubanandham, V. De Andrade, F. De Carlo, N. Chawla, 3D microstructural characterization of aluminum alloys using transmission X-ray microscopy (TXM), MRS Spring Meeting, PHX, AZ, (2017).
20. C. S. Kaira, **S. S. Singh**, C. Kantzos, A. Kirubanandham, V. De Andrade, F. De Carlo, N. Chawla, Nanoscale 4D microstructural evolution of precipitates in aluminium alloys using transmission X-ray microscopy (TXM), TMS Annual Meeting, San Diego, CA, USA (2017).
21. T. J. Stannard, S. Niverty, **S. S. Singh**, J. J. Williams, N. Chawla, X. Xiao, P. Kenesei, J. Almer, F. De Carlo, Microstructural and Environmental Effects on Stress Corrosion and Corrosion-Fatigue of 7075 Aluminum Alloy, American Society of Mechanical Engineers – International Mechanical

- Engineering Conference and Exposition, Phoenix, AZ, (2016).
22. **S. S. Singh**, T. Stannard, S. Niverty, J. J. Williams, X. Xiao, F. De Carlo, N. Chawla, Microstructural and environmental effects on stress corrosion and corrosion fatigue of 7075 aluminum alloy, Environmental Damage in Structural Materials, Cork, Ireland, (2016).
 23. X. Wang, **S. S. Singh**, N. Chawla, H. Jiang, Direct measurements of Li-Si composition, volume expansion and modulus variation of amorphous Si after electrochemical lithiation, ASME IMECE, PHX, AZ, (2016).
 24. T. Stannard, **S. S. Singh**, A. S. S. Sundar, J.J. Williams, N. Chawla, X. Xiao, F. De Carlo, In situ synchrotron x-ray tomography investigation of corrosion-fatigue crack behavior of 7075 aluminium alloys, International conference on fatigue damage of structural materials XI, Hyannis, MA, (2016).
 25. T. Stannard, **S. S. Singh**, J. J. Williams, A. S. S. Singaravelu, C. Mayer, X. Xiao, F. De Carlo, N. Chawla, 4D in situ study of fatigue crack initiation and growth from corrosion pits in 7075 aluminum alloys, International Materials Research Congress XXV, Cancun, MX, (2016).
 26. T. Stannard, **S. S. Singh**, A. S. S. Sundar, S. Niverty, J.J. Williams, N. Chawla, X. Xiao, F. De Carlo, In situ three dimensional study of corrosion fatigue crack initiation and growth of corroded 7075 aluminum alloys, Environmental Damage in Structural Materials, Cork, Ireland, (2016) (poster).
 27. T. Stannard, **S. S. Singh**, J. J. Williams, A. S. S. Singaravelu, C. Mayer, X. Xiao, D. De Carlo, N. Chawla, 4D in situ study of fatigue crack initiation and growth from corrosion pits in 7075 aluminum alloys, MRS Spring Meeting, PHX, AZ, (2016). (Best Poster Award)
 28. C. S. Kaira, V. De Andrade, **S. S. Singh**, A. Kirubanandham, C. Kantzos, F. De Carlo, N. Chawla, Nanoscale 3D microstructural characterization of aluminium alloys using transmission x-ray microscopy (TXM), MRS Spring Meeting, PHX, AZ, (2016).
 29. T. L. Burnett, **S. S. Singh**, S.A. McDonald, N. J. H. Holroyd, P. J. Withers, N. Chawla, Competition of stress corrosion crack branches observed in-situ using time-lapse 3D synchrotron computed tomography, Environmental Damage in Structural Materials 2016, Cork, Ireland, (2016).
 30. S. Das, **S. S. Singh**, N. Chawla, N. Neithalath, Nanoindentation to extract phase properties of fly ash geopolymers for macroscale predictions, ACI Fall convention, Philadelphia, (2016).
 31. P. Hruby, **S. S. Singh**, R. Yuan, J. Williams, J. Oswald, X. Xiao, N. Chawla, Characterization of damage evolution in SiC particle reinforced Al matrix composites by x-ray tomography and extended finite element modeling, TMS Annual Meeting, Nashville, TN, (2016).
 32. C. S. Kaira, **S. S. Singh**, V. De Andrade, F. De Carlo, N. Chawla, In situ characterization of nanoscale precipitate nucleation and growth in aluminum alloys using transmission x-ray microscopy (TXM), 3D Materials Science, St. Charles, IL, (2016).
 33. A. Merkle, N. Chawla, **S. S. Singh**, L. Lechner, Multi-scale 3D Experimental Workflow of an Aluminum 7075 Alloy, 3D Materials Science, St. Charles, IL, (2016).
 34. J. Mertens, A. Kirubanandham, **S. S. Singh**, A. Merkle, X. Xiao, Y. Jiao, N. Chawla, Multi-scale, multi-model analysis of deformation behavior in metallic materials by x-ray microtomography, FIB, and EBSD, TMS Annual Meeting, Nashville, TN, (2016).
 35. A. P. Merkle, L. Lechner, **S. S. Singh**, N. Chawla, Automated correlative tomography of an aluminum 7075 alloy spanning length scales and modalities, TMS Annual Meeting, Nashville, TN, (2016).
 36. C. S. Kaira, **S. S. Singh**, V. De Andrade, F. De Carlo, N. Chawla, In situ characterization of nanoscale precipitate nucleation and growth in aluminum alloys using transmission x-ray microscopy (TXM), TMS Annual Meeting, Nashville, TN, (2016). (Poster)
 37. C. Mayer, Y. Lingwei, **S. S. Singh**, Y-L. Shen, J. Molina-Aldareguia, J. LLorca, N. Chawla, Anisotropy, size, and aspect ratio effects in micropillar compression of Al-SiC nanolaminate

- composites, TMS Annual Meeting, Nashville, TN, (2016).
38. T. Stannard, J. Williams, **S. S. Singh**, X. Xiao, N. Chawla, In situ corrosion-fatigue of 7075 aluminum in 3.5 wt% NaCl, TMS Annual Meeting, Nashville, TN, (2016).
 39. I. Lujan-Regalado, A. Kirubanandham, C. Mayer, **S. S. Singh**, J. Williams, N. Chawla, Effect of crystal orientation and microstructure on the nucleation and growth of Tin (Sn) hillocks by in situ nanoindentation and electron backscattered diffraction (EBSD), TMS Annual Meeting, Nashville, TN, (2016).
 40. R. Vallabhaneni, E. Izadi, C. Mayer, **S. S. Singh**, C. S. Kaira, J. Rajagopalan, N. Chawla, In situ FIB/SEM tensile testing of Tin (Sn) whiskers, TMS Annual Meeting, Nashville, TN, (2016).
 41. S. Singh, J. C. E. Mertens, C. Shashank Kaira, H. Li, **S. S. Singh**, Y. Jiao, N. Chawla, Effect of spatial distribution of borosilicate particles in polypropylene matrix composites using X-ray microtomography, TMS Annual Meeting, Nashville, TN, (2016).
 42. C. Mayer, Y. Lingwei, **S. S. Singh**, J. Molina-Aldareguia, Y.L. Shen, N. Li, N. Mara, N. Chawla, Mechanical characterization of Al-SiC Nanolaminate composites using micromechanical testing methods, SES, TX (2015).
 43. **S. S. Singh**, J. J. Williams, T. Stannard, X. Xiao, F. De Carlo, N. Chawla, In situ materials science: microstructural evolution of materials with time, ASME, Seattle, WA, (2015).
 44. **S. S. Singh**, J. J. Williams, X. Xiao, P. Kenesei, F. De Carlo, J. Almer, N. Chawla, Quantification of fatigue crack closure using 3D synchrotron x-ray tomography, ASME, Seattle, WA, (2015).
 45. T. Lai, **S. S. Singh**, A. Sundaram, N. Chawla, M-L Lind, The hydrogen permeability of amorphous NiNb-M (M=Sn,Ti and Zr) metallic membrane, North American Membrane Society (NAMS), Boston, MA, (2015).
 46. **S. S. Singh**, J. C. E. Mertens, J. J. Williams, P. Hruby, A. Kirubanandham, X. Xiao, F. De Carlo, N. Chawla, Advanced noise-reduction and segmentation methods in x-ray computed microtomography, 2nd International Conference on Tomography of Materials and Structures (ICTMS), Quebec, Canada, (2015).
 47. B. M. Patterson, N. Chawla, A. R. Ovejero, T. Stannard, **S. S. Singh**, X. Xiao, A. Ionita, D. Dalvit, D. S. Moore, K. Henderson, N. Cordes, Understanding material structure and performance with 3D x-ray imaging, 64th Annual Conference on Applications of X-ray Analysis - Denver X-ray Conference, Westminster, CO, (2015).
 48. **S. S. Singh**, T. Stannard, J. J. Williams, X. Xiao, N. Chawla, In situ investigation of stress corrosion cracking of aluminum alloys by x-ray synchrotron tomography, TMS Annual Meeting, Orlando, FL, (2015).
 49. R. Yuan, **S. S. Singh**, N. Chawla, J. Oswald, An extended finite element algorithm for the fracture analysis of metal matrix composites with realistic SiC particle geometries obtained from x-ray synchrotron tomography data, 13th U.S. National Congress on Computational Mechanics, San Diego, CA, (2015).
 50. X. Wang, **S. S. Singh**, T. Ma, N. Chawla, H. Jiang, Direct measurements of Li-Si composition, volume expansion and modulus variation of amorphous Si after electrochemical lithiation, IMECE, Houston, TX, (2015).
 51. A. P. Merkle, L. Lechner, L. Hunter, J. Gelb, **S. S. Singh**, N. Chawla, Automated correlative tomography of an aluminum 7075 alloy spanning length scales and modalities, Microscopy and Microanalysis (M&M), Portland, OR, (2015).
 52. I. Lujan-Regalado, **S. S. Singh**, A. Kirubanandham, J. J. Williams, N. Chawla, Characterization of tin whiskering and influence of microstructure on its formation, TMS Annual Meeting, Orlando, FL, (2015). (Poster)

53. P. Hruby, **S. S. Singh**, J. J. Williams, X. Xiao, F. De Carlo, N. Chawla, Four dimensional synchrotron tomography of fatigue crack growth and damage in metal matrix composites, International Conference on Composite Materials (ICCM), Copenhagen, Denmark, (2015).
54. R. Vallabhaneni, E. Izadi, **S. S. Singh**, C. Mayer, J. Rajagopalan, N. Chawla, In-situ tensile behavior of tin whiskers, TMS Annual Meeting, Orlando, FL, (2015).
55. J. J. Williams, **S. S. Singh**, P. Kenesei, J. Almer, X. Xiao, F. De Carlo, N. Chawla, Investigating the plastic zone at the tip of a crack: A 3D diffraction and imaging study using synchrotron x-rays, TMS Annual Meeting, Orlando, FL, (2015).
56. B. M. Patterson, N. Chawla, **S. S. Singh**, M. F. Lin, J. J. Williams, X. Xiao, M. Robinson, Z. Smith, K. Henderson, N. Cordes, Dynamic in-situ compression with synchrotron 3D tomographic imaging of cellular materials, TMS Annual Meeting, Orlando, FL, (2015).
57. **S. S. Singh**, J. J. Williams, P. Hruby, J. C. E. Mertens, A. Kirubanandham, N. Chawla, X. Xiao, F. De Carlo, Image analysis of time-evolved x-ray microtomography data sets using Avizo Fire, Americas Amira-Avizo user group Meeting (AAAUGM), Boston, MA, (2014).
58. **S. S. Singh**, J. J. Williams, N. Chawla, X. Xiao, F. De Carlo, Microstructural and environmental effects on FCG in 7075 Al alloy, Environmental Effects on Damage in Materials, Bergamo, Italy, (2014).
59. **S. S. Singh**, C. Schwartztein, J. J. Williams, X. Xiao, F. De Carlo, N. Chawla, 3D microstructural characterization and mechanical properties of constituents particles in Al 7075 alloys using x-ray synchrotron tomography and nanoindentation, TMS Annual Meeting, San Diego, CA, (2014).
60. **S. S. Singh**, R. Sarkar, H. Xie, C. Mayer, J. Rajagopalan, N. Chawla, Tensile behavior of Sn whiskers by FIB lift-out and MEMS testing in SEM,” TMS Annual Meeting, San Diego, CA, (2014).
61. P. Hruby, **S. S. Singh**, J. J. Williams, H. Xie, R. Xu, X. Xiao, F. De Carlo, N. Chawla, Quantitative measurement of plastic zone size in Al 7075 using a combination of x-ray synchrotron laue microdiffraction and microtomography, TMS Annual Meeting, San Diego, CA, (2014). (Poster)
62. S. Safarkhani, R. Yuan, **S. S. Singh**, J. Oswald, N. Chawla, Numerical modeling of damage in Al-SiC composites by Extended Finite Element (XFEM), TMS Annual Meeting, San Diego, CA, (2014).
63. P. Hruby, **S. S. Singh**, J.J. Williams, X. Xiao, R. Xu, P. Kenesei, F. Decarlo, J. Almer, N. Chawla, Investigating the plastic zone at the tip of a crack: A 3D diffraction and imaging study using synchrotron x-rays, International Congress on 3D Materials Science 2014, Annecy, France, (2014).
64. B. M. Patterson, Z. Smith, K. Henderson, N. Cordes, N. Chawla, J. J. Williams, **S. S. Singh**, E. Guo, X. Xiao, Dynamic compression imaging of syntactic foams using synchrotron x-ray computed tomography, Syntactic and Composite Foams IV, Santa Fe, NM, (2013).
65. J. J. Williams, **S. S. Singh**, X. Xiao, P. Kenesei, F. Decarlo, J. Almer, N. Chawla, Investigating the plastic zone at the tip of a crack: A 3D diffraction and imaging study using synchrotron x-rays, Developments in X-Ray Tomography IX, SPIE Optics + Photonics 2014, San Diego, CA, (2014).
66. R. Yuan, **S. S. Singh**, N. Chawla, J. Oswald, Efficient methods for implicit geometrical representation of complex material microstructures, 12th U.S. National Congress on Computational Mechanics, Raleigh, NC, (2013).
67. J.J. Williams, **S.S. Singh**, X. Xiao, F. De Carlo, N. Chawla, Understanding fatigue and corrosion-fatigue behavior by in situ 3D x-ray synchrotron tomography, PRICM-08, Waikaloa, HI, (2013).
68. **S. S. Singh**, J. J. Williams, X. Xiao, F. De Carlo, N. Chawla, Fatigue crack closure and corrosion fatigue in Al 7075 alloy using in situ x-ray synchrotron tomography, TMS Annual Meeting, San Antonio, TX, (2013).

RESEARCH PROJECTS

- Creep Behaviour of Aluminium Alloys at Small Length Scale Using Nanoindentation, IIT Kanpur, PI, (2016-2019) **Completed**
- Laser Assisted Fabrication of Functionally and Microstructurally Graded Thermal Protection Systems (TPS) for Reusable Launch Vehicles (RLV), ISRO, PI, (2016-2019) **Completed**
- Development of Lanthana (La₂O₃) Based ODS Steels for Nuclear Reactor Application, SERB, PI, (2017-2020)
- Microstructural and Mechanical Characterization of High-Silicon Stainless Steel, ISRO, Co-PI (2017-2020)
- Synthesis and Characterization Al-B and Al-B₄C alloys as Fuel in Solid Propellant, ISRO, PI (2019 – 2021)
- Development of process map for additive manufacturing of Inconel alloys, DST-AMT, Co-PI (2018 – 2020)

TEACHING

- **TA201A:** Introduction to Manufacturing (Instructor)
- **MSE302A:** Mechanical Behaviour of Materials (Instructor)
- **MSE313A:** Mechanical Behaviour Laboratory (Instructor)
- **MSE661A:** Fracture, Fatigue and Creep: Materials and Models (Instructor)
- **TA201A:** Manufacturing Processes I (Tutor)
- **MSE315A:** Manufacturing Process Laboratory (Instructor)
- **MSE690A/MSE691A:** Seminar Participation (Instructor)
- **MSE617A:** Mathematic and Computational Methods (Instructor)
- **MSE671A:** Heat Treatment and Surface Hardening (Instructor)
- **ESO201A:** Nature and Properties of Materials (Tutor)

AWARDS/HONORS

- **2018 SMD JOM Best Paper Award** by The Minerals, Metals & Materials Society (TMS)
- **Council Member (2017-2018, 2018 -2019, 2019-2020)**, Indian Institute of Metals (IIM)
- **Young Metallurgist of the Year Award 2017** in metal science division by IIM (Indian Institute of Metals)
- **IEI Young Engineers Award 2017-2018** in Metallurgical and Materials Engineering Discipline by The Institution of Engineers (India)
- **Teaching Excellence Certificates** for the following courses at IIT Kanpur
 - ✓ MSE302A: Mechanical Behavior of Materials (SEM I, 2016-2017)
 - ✓ MSE661A: Fracture, Fatigue and Creep: Materials and Models (SEM II, 2016-2017)
 - ✓ MSE302A: Mechanical Behavior of Materials (SEM I, 2017-2018)
 - ✓ MSE313A: Mechanical Behavior Laboratory (SEM I, 2017-2018)
 - ✓ MSE617A: Mathematic and Computational Methods (SEM II, 2018-2019)
 - ✓ MSE671A: Heat Treatment and Surface Hardening (SEM I, 2019-2020)
- **Certificate of Excellence** for Outstanding Dissertation in Materials Science and Engineering Department, Arizona State University (2016)
- ASU Student Travel Award (2014, 2015)

- Award for **Best Contribution** in “Study and Suggest Measures to Improve Billet Internal Quality for 36-40 mm Rebars”, Flat Product Technology Group (FPTG), Tata Steel, India (2011).
- **Institute Silver Medal**, IIT Kharagpur, India (2008).
- **Best B. Tech Project Work**, Metallurgical and Materials Engineering Department, IIT Kharagpur, India (2008)
- **Indranil Award for Metallurgy**, The Mining, Geological & Metallurgical Institute of India, India (2008).
- **Ramneek Sodhi Memorial Award**, IIT Kharagpur, India (2008)
- **1st** place in metallography and **2nd** place in paper presentation in Congress of Metallurgical Professionals involving Students, Industry and Teachers (COMPOSIT), IIT Kharagpur (2008).
- **J. B. Ghosh Memorial Award**, IIT Kharagpur, India (2007)
- **Pradeep Kumar Chakraborty Award**, IIT Kharagpur, India (2007)
- **Smt. Ava Sanyal Memorial award**, IIT Kharagpur, India (2007)
- **Tata Scholarship** by Tata Steel, India (2006-2008).
- **Tata Steel Millennium Scholarship** by Tata Steel, India (2004-2006).
- **Certificate of Honour**, Mrs. K. M. P. M. Inter College, India (2003)

PROFESSIONAL ACTIVITIES

- **Warden In-charge**, Hall 2, Indian Institute of Technology, Kanpur (Feb 2020 – To date)
- **Core committee member**, Unnat Bharat Abhiyan (Sep 2017 – To date)
- **Member**, Animal welfare committee (AWC), IIT Kanpur (Jan 2020 – To date)
- **Warden In-charge**, Hall 4, Indian Institute of Technology, Kanpur (Sep 2018 – Aug 2019)
- **Warden**, Hall 4, Indian Institute of Technology, Kanpur (May 2016 – Aug 2018)
- **Co-Convener**: International Conference on Materials Engineering (ICME 2017)
- **Chairman: Exhibition and Co-Chairman: Publicity and Communication** (NMD-ATM 2016)
- **Council Member**, Indian Institute of Metals (2017-2018, 2018-2019)
- **Secretary**, Indian Institute of Metals (IIM-Kanpur Chapter: 2016-2017, 2018-2019, 2019-2020)
- **Life member**, Indian Institute of Metals (IIM)
- **Member**, Society of Failure Analysis
- **Member**, Tau Beta Pi (USA)
- **Member**, Phi Kappa Phi (USA)
- **Member**, The Minerals, Metals & Materials Society (TMS)
- **Member**, American Society of Mechanical Engineers (ASME)
- **Reviewer**: Materials Science and Engineering A (*outstanding reviewer*), Materials and Design, Materials Characterization, Journal of Materials Processing Technology, Scientific Reports, Kirk-Othmer Encyclopedia, Vacuum, Transaction of Indian Institute of Metals (IIM), Philosophical Magazine, Corrosion Science, Materials Research, Engineering Fracture Mechanics, Metallurgical and Materials Transactions A, Journal of Alloys and Compounds, Scripta Materialia,
- **Session Chair** at ASME, Seattle (2015), **Session Convener** in Advances in Non-ferrous Metallurgy: Applications in Defense and Aerospace, NMD-ATM 2017, Goa (2017)