SOMNATH GHOSH

Michael G. Callas Chair Professor

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☐ RESEARCH EXPERTISE AND INTERESTS

Computational Engineering & Sciences integrating Computational Mechanics & Physics, Computational Materials Science, and Integrated Computational Materials Engineering (ICME), with emphasis on Multiscale Modeling, Structure-Materials Modeling & Simulations, Multi-Physics Modeling of Multi-Functional Materials, Materials Characterization, Process Modeling, Machine Learning, Uncertainty Quantification, Additive Manufacturing

Specific areas of activity include:

- Additive Manufacturing: Digital Twin for process-microstructure-performance and life
- Spatial and temporal multiscale, multiphysics modeling method development
- Modeling failure and fatigue in metals, composites, and multifunctional materials
- Coupled phase-field crystal plasticity modeling for heterogeneous materials
- Fatigue and failure modeling and damage sensing of engineering components
- Data-driven methods, Machine Learning and Uncertainty Quantification
- Synthetic microstructure builders, statistically equivalent RVEs
- Atomistic-continuum multiscale modeling of polymeric and metallic materials
- Novel computational model development

☐ EDUCATION

- ***Ph.D.*** 1988, *Mechanical Engineering & Applied Mechanics*, Univ. of Michigan, Ann Arbor, MI.
- ***M.S.*** 1983, *Theoretical and Applied Mechanics*, Cornell University, Ithaca, New York.
- ***B. Tech.*** 1980, *Mechanical Engineering*, Indian Institute of Technology, Kharagpur, India

☐ PROFESSIONAL EXPERIENCE

- ***Employment***

2011-present ***Michael G. Callas Chair Professor***, Civil & Systems Engineering, Johns Hopkins University
2011- present ***Professor***, Mechanical Engineering, Johns Hopkins University
2014- present ***Professor***, Materials Science & Engineering, Johns Hopkins University
2010-2011 ***Research Professor***, Civil Engineering, Johns Hopkins University
2004-2011 ***John B. Nordholt Professor***, Mechanical Engineering, The Ohio State University
1999-2011 ***Professor***, Mechanical Engineering, The Ohio State University
2001-2011 ***Professor***, Materials Science & Engineering, The Ohio State University
2002-2003 ***Chair***, Applied Mechanics Group, Mechanical Engineering, The Ohio State University
1995-1999 ***Associate Professor***, Aerospace Eng., Applied Mechanics & Aviation, The Ohio State Univ.
1996-2011 ***Adjunct Professor***, Biomedical Engineering, The Ohio State University
1997 ***Visiting Professor***, Civil Engineering, University of Bordeaux I, France
1991-1995 ***Assistant Professor***, Engineering Mechanics, The Ohio State University
1988-1991 ***Assistant Professor***, Engineering Mechanics**,** The University of Alabama
1986-1987 ***Instructor,*** Mechanical Engineering & Applied Mechanics**,** University of Michigan

♦ ***Professional Leadership***

2023-2028 ***Co-Director/Co-PI of the Institute for Modeling-based Qualification and Certification of Additive Manufacturing (IMQCAM):*** *A NASA Space Technology Research Institute (STRI)*

2018-2022 ***Publications Committee Chair & JOM Advisor***, ICME Committee, (**TMS**)

2018-2020 ***Vice-President, Board of Governors***, Engineering Mechanics Institute, (**EMI/ASCE**)
Treasurer (2017-2018), ***Member of BoG*** (2016-2020) , (**EMI/ASCE**)

2014-2016 ***President,*** US Association for Computational Mechanics (**USACM**),
Vice-President (2012-2014), ***Secretary/Treasurer*** (2010-2012). ***Past-President*** (2016-2020),
Member of Executive Council (2008-2012, 2002-2006)

2013- ***Founder/Director***, JHU Center for Integrated Structure-Materials Modeling & Simulation (**CISMMS**)

2016-2018 ***Founder/Director***, JHU Software Hub (JHU-SofHub)

2012-2018 ***Director & PI***, Air Force Center of Excellence on Integrated Materials Modeling (**CEIMM)**

2015- ***Governing Board Member,*** Gordon Research Conference on *Multifunctional Materials & Structures: The Science of Autonomic, Adaptive and Self-Sustaining Systems*

2011-2013 ***Chair,*** Computational Mechanics Committee, Engineering Mechanics Institute, ASCE
Vice-Chair (2010-2011), ***Past-Chair*** (2013-2017) (**EMI/ASCE**)

2009-2022 ***Member of General Council,*** International Assoc. of Computational Mechanics (**IACM**)

2007-2011 ***Chair,*** ASME-AMD Committee of Computing in Applied Mechanics (CONCAM)
(***Vice-Chair:*** 2005-2007), **(ASME/AMD**)

2007-2009 ***Chair,*** ASME-AMD Committee of Materials Processing and Manufacturing (MPM)
(***Vice-Chair:*** 2005-2007), **(ASME/AMD**)

♦ ***Chair/Co-Chair of Major Conferences and Workshops***

2022 ***Co-Chair,*** Organizing Committee, *10th International Conference on Multiscale Materials Modeling (MMM 2022)*, Baltimore, MD.

2022 ***Co-Chair,*** Organizing Committee, *Engineering Mechanics Institute Conference EMI-2022*, Baltimore, MD.

2016 ***Chair,*** Organizing Committee, *IUTAM Symposium on Integrated Computational Structure-Material Modeling of Deformation and Failure under Extreme Conditions*, Baltimore, MD.

2012 ***Chair,*** Organizing Committee, 22nd International Workshop on Computational Mechanics of Materials (*IWCMM-XXII*)

2009 ***Chair,*** Organizing Committee, *10th United States National Congress on Computational Mechanics (USNCCM)*, Columbus, OH

2004 ***Chair,*** *NUMIFORM 2004: Numerical Methods in Industrial Forming Processes*, Columbus, OH

1998 ***Co-Chair****, The Integration of Material, Process and Product Design*, Seven Springs, PA

♦ ***Major Professional Service***

2024 ***Member of Red Team***, Maturation of computational materials approaches in qualification and certification for metal additive manufacturing, NASA-FAA Computational Materials for Qualification and Certification

2023 ***Member of External Review Panel***, Structural Materials, Naval Research Laboratory

2023 ***Member of Scientific Advisory Board***, Center for Extreme Events in Structurally Evolving Materials, University of Wisconsin

2019-2024 ***Member of Advisory Council***, LAETA- Associated Laboratory for Energy, Transports and Aeronautics, a R&D network with engineering in Portugal

2020 ***Chair of Computational Structural Mechanics***, Vaibhav Summit, Government of India

2018-2019 ***Member of Advisory Panel***, NASA Aeronautics Research Mission Directorate, on Materials and Methods for Rapid Manufacturing for Commercial and Urban Aviation

2018 ***Member of External Review Team***, Los Alamos National Laboratory for LDRD project on "*Material Processing to Performance: A Path to Physically-Based Predictive Capability*"
2016- ***Member of External Advisory Team***, Comprehensive Digital Transformation (CDT), NASA Langley Research Center (LeRC)
2016 ***Member of External Evaluation Team***, Department of Materials Design and Innovation University of Buffalo, NY
2016 ***Member***, Corporate Strategic Research's 2016 CTC Reassessment Panel, ExxonMobil Corp.

☐ AWARDS and HONORS

♦ *Awards*

2024 ***JN Reddy Medal*** for Mechanics of Advanced Materials and Structures **(ICMAMS**)
2023 ***Distinguished Scientist/Engineer Award,*** Materials Processing & Manufacturing Division, The Minerals, Metals, and Materials Society (**TMS**)
2022 ***Raymond D. Mindlin Medal***, American Society of Civil Engineers (**ASCE**)
2021 ***J. Tinsley Oden Medal***, US Association for Computational Mechanics (**USACM**)
2020 ***Computational Mechanics Award***, International Association for Computational Mechanics (**IACM**)
2019 ***Ted Belytschko Applied Mechanics Award***, ASME Applied Mechanics Division (**ASME/AMD**)
2018 ***ICCM Investigator Medal***, International Conference on Computational Methods (**ICCM**)
2017 ***Distinguished Scientist/Engineer Award,*** Structural Materials Division, The Minerals, Metals, and Materials Society (**TMS**)
2013 ***Distinguished Alumnus Award***, Indian Institute of Technology (**IIT**), Kharagpur
2013 ***Nathan M. Newmark Medal,*** American Society of Civil Engineers (**ASCE**)
2007 ***University Distinguished Scholar Award,*** The Ohio State University (**OSU**)
2001 ***Harrison Faculty Award*** for Excellence in Engineering Education**,** The Ohio State University (**OSU**)
2008 ***Lumley Faculty Research Award***, College of Engineering, The Ohio State University (**OSU**)
2004 ***Lumley Interdisciplinary Research Award***, College of Engineering, The Ohio State University
2003 Co-author of the winner of ***Robert J. Melosh Medal*** (Duke University)
2003 ***Lumley Faculty Research Award***, College of Engineering, The Ohio State University (**OSU**)
1998 ***Lumley Faculty Research Award***, College of Engineering, The Ohio State University (**OSU**)
1994 ***Lumley Faculty Research Award***, College of Engineering, The Ohio State University (**OSU**)
1994 ***NSF National Young Investigator (NYI) Award***, National Science Foundation
1990 ***Science Support Award,*** Alcoa Foundation
1990 ***Research Initiation (RIA) Award***, National Science Foundation

♦ *Fellow of Professional Societies*

2021 ***Fellow,*** The Minerals, Metals and Materials Society (**TMS**)
2019 ***Fellow,*** Society of Engineering Science (**SES**)
2014 ***Fellow,*** Engineering Mechanics Institute, American Society of Civil Engineers (**EMI/ASCE**)
2010 ***Fellow,*** International Association of Computational Mechanics (**IACM**)
2010 ***Fellow,*** American Academy of Mechanics (**AAM/ASME**)
2007 ***Fellow,*** American Association for the Advancement of Science (**AAAS**)
2007 ***Fellow,*** United States Association of Computational Mechanics (**USACM**)
2006 ***Fellow,*** ASM International, The Materials Information Society (**ASM**)
2000 ***Fellow,*** American Society of Mechanical Engineers (**ASME**)

♦ *Honors*

2018 ***TMS-SMD Speaker***, 147th TMS Annual Meeting, Phoenix, Arizona

2012 ***Lecturer of CISM*** short course on *Multiscale Modelling of Complex Materials*, Udine Italy
2011 ***Michael G. Callas Chair,*** Whiting School of Engineering, Johns Hopkins University
2004 ***John B. Nordholt Professorship,*** College of Engineering, The Ohio State University
1975 ***National Scholar***, Government of India

♦ ***Research Awards for Students & Post-Doctoral Researchers***

2024	Y. Xiao	***2nd Place Award,*** Student Paper Competition in Modeling Inelasticity & Multiscale Behavior, 2024 Engineering Mechanics Institute Conference & PMC, University of Illinois UC, Chicago, Il.
2023	P. Tarafder	***1st Place Award,*** Student Paper Competition, 2023 US National Conference on Computational Mechanics, July 2023, Albuquerque, New Mexico.
2023	S. Dan	***1st Place Award,*** Student Paper Competition in Computational Mechanics, 2023 Engineering Mechanics Institute Conference, June 2023, Georgia Institute of Technology, Atlanta, GA.
2023	B. Murgas	***1st Place Award,*** Poster Competition 7th World Congress on Integrated Computational Materials Engineering (ICME 2023), May 2023, Orlando FL**.**
2022	S. Dan	***2nd Place Award,*** IOP sponsored Student Poster Competition, International Conference on Multiscale Materials Modeling (MMM 2022), Baltimore.
2022	S. Dan	***1st Place Award,*** Student Paper Competition in Modeling Inelasticity & Multiscale Behavior, 2022 Engineering Mechanics Institute Conference, Johns Hopkins University, Baltimore, MD.
2022	O. Ozbayram	***2nd Place Award,*** Student Paper Competition in Modeling Inelasticity & Multiscale Behavior, 2022 Engineering Mechanics Institute Conference, Johns Hopkins University, Baltimore, MD.
2022	P. Tarafder	***1st Place Award,*** Student Paper Competition in Computational Mechanics, 2022 Engineering Mechanics Institute Conference, Johns Hopkins University, Baltimore, MD.
2021	J. Shen	***1st Place Award,*** Student Paper Competition in Modeling Inelasticity & Multiscale Behavior, 2021 Engineering Mechanics Institute Conference, Columbia University, New York, NY.
2021	P. Tarafder	***2nd Place Award,*** Student Paper Competition in Modeling Inelasticity & Multiscale Behavior, 2021 Engineering Mechanics Institute Conference, Columbia University, New York, NY.
2020	D. Ozturk	***Melosh Medal Finalist,*** for one of the 5 best student papers in Computational Mechanics, Duke University
2019	X. Tu	***2nd Place Award,*** Student Paper Competition in Computational Mechanics, 2019 Engineering Mechanics Institute Conference, Caltech, Pasadena, CA
2018	S. Chakraborty	***3rd Place Award,*** Student Poster Competition**,** The 13th World Congress in Computational Mechanics, WCCM 2018, New York City, NY
2017	G. Weber	***1st Place Award,*** Student Paper Competition**,** US National Conference on Computational Mechanics, Montreal, Canada
2016	R. Yaghmaie	***1st Place Award****,* Student Paper Competition in Dynamics, Engineering Mechanics Institute (EMI/PMC) Conference, Vanderbilt University
2016	J. Cheng	***Melosh Medal Finalist,*** for one of the 6 best student papers in Computational Mechanics, Duke University
2013	S. Keshavarz	***1st Place Award****,* Johns Hopkins Annual Postdoctoral Poster Competition
2013	J. Cheng	***3rd Place Award****,* Student Poster Competition in Computational Mechanics, Engineering Mechanics Institute Conference, Northwestern U. Evanston, IL
2013	S. Guo	***1st Place Award,*** US National Conference on Computational Mechanics, Raleigh, NC

2013	P. Chakraborty	***Melosh Medal Finalist,*** for one of the 6 best student papers in Computational Mechanics, Duke University
2013	C. Alleman	***People's Choice Award***, Student Poster Competition, Mach Conference
2012	C. Alleman	***1st Place Award***, Student Poster Competition in Computational Mechanics, Engineering Mechanics Institute (EMI/PMC) Conference, U. Notre Dame
2012	J. Zhang	***3rd Place Award***, Student Poster Competition in Computational Mechanics, Engineering Mechanics Institute (EMI/PMC) Conference, U. Notre Dame
2010	P. Chakraborty	***Honorable Mention,*** Melosh Medal Competition
2010	D. Paquet	***2nd prize at Hayes Graduate Research forum***, OSU
2009	D. Paquet	***Best poster award***, Gordon Research Conference on Physical Metallurgy
2008	V. Dakshinamurthy	***Presidential Fellowship for Dissertation Research***, OSU
2008	H. Bhatnagar	***Outstanding Research Award***, Mechanical Engineering, OSU
2007	H. Bhatnagar	***Outstanding Doctoral Student Award***, NASA URETI Program
2006	S. Manchiraju	***1st Place Award***, Student Paper Competition in Materials Modeling, 7th World Congress of Computational Mechanics at Los Angeles, CA.
2006	S. Li	***Melosh Medal Finalist***, for one of the 6 best student papers in Computational Mechanics, Duke University
2006	M. Groeber	***1st prize***, Hayes Graduate Research forum, The Ohio State University
2006	H. Bhatnagar	***3rd prize***, Hayes Graduate Research forum, The Ohio State University
2003	P. Raghavan	***Melosh Medal Winner,*** best student paper in Computational Mechanics, Duke University
2003	S. Pearson	***2nd prize,*** Denman Graduate Research forum, The Ohio State University
2002	P.E. Eder	***2nd prize,*** Hayes Graduate Research forum, The Ohio State University
2001	P. Raghavan	***3rd prize,*** Hayes Graduate Research forum, The Ohio State University
1997	K. Lee	***2nd prize,*** Hayes Graduate Research forum, The Ohio State University

❑ PUBLICATIONS AND SCHOLARLY OUTPUTS

https://orcid.org/0000-0003-0793-6058

Google Scholar	*https://scholar.google.com/citations?user=26hAyBsAAAAJ&hl=en*
Scopus	*https://www.scopus.com/authid/detail.uri?authorId=7404806425*
Web of Science	*https://www.webofscience.com/wos/author/record/A-2867-2012*
ResearchGate	*https://www.researchgate.net/profile/Somnath-Ghosh-5/scores*

♦ Books

1. **S. Ghosh**, C. Przybyla, and C. Woodward (co-editors), "*Integrated Computational Materials Engineering (ICME): Advancing Computational and Experimental Methods*", Springer Nature Switzerland AG, March 2020, 415 pages, ISBN 978-3-030-40561-8.

2. W. Cai and **S. Ghosh**, (section editor): "*Crystal Plasticity: Atomistics to Macroscale*" in ***Handbook of Materials Modeling, Volume 1 Methods: Theory and Modeling***, S. Yip and W. Andreoni (editors), Springer International Publishing AG, Gewerbestrasse 11 6330 Cham, Switzerland, 2019, ISBN 978-3-319-42913-7

3. **S. Ghosh,** "*Micromechanical Analysis and Multi-Scale Modeling Using the Voronoi Cell Finite Element Method"*, CRC Press/Taylor & Francis, 2011, 729 pages, ISBN: 978-1-4200-9437-4.

4. **S. Ghosh** and D. Dimiduk (co-editors), "*Computational Methods for Microstructure-Property Relations*", Springer NY, 1st Edition, 2011, 790 pages, ISBN: 978-1-4419-0642-7.

♦ Proceedings Editor

1. **S. Ghosh**, J. Castro and J.K. Lee (co-editors), "***Materials Processing and Design: Modeling, Simulation and Application:*** *Proceedings of NUMIFORM, the 8th International Conference on Numerical Methods in Industrial Forming Processes*," Volume I and Volume II, AIP Publishers, 2004, 2298 pages.

2. N. Zabaras, R. Becker, S. **Ghosh**, and L. Lalli (co-editors), "***The Integration of Materials, Process and Product Design***, A.A. Balkema Publishers, Rotterdam, 1999, 281 pages.

3. **S. Ghosh** and M. Ostoja-Starzewski (co-editors), "***Computational Methods in Micromechanics:*** *ASME Proceedings of ASME"*, AMD-Vol. 212, MD-Vol. 62, 1995, 175 pages.

♦ Special Issues and Book Editor

1. **S. Ghosh,** D. McDowell and James Saal, *Co-Editors of Special issue* "Augmenting Methods in ICME with Machine Learning and Uncertainty Quantification**"** ***JOM, Journal of The Minerals, Metals & Materials Society*** (TMS), Vol. 72, No. 12, December 2020, and Vol. 73, No. 1, 2020.

2. **S. Ghosh** and D. McDowell, *Co-Editors of Special issue* "Multi-scale Computational Strategies for Heterogeneous Materials with Defects: Coupling Modeling with Experiments and Uncertainty

Quantification***" JOM, Journal of The Minerals, Metals & Materials Society*** (TMS), Vol. 71, No. 8, August 2019. doi.org/10.1007/ s11837-019-03589-3, 2019.

3. W. Cai and **S. Ghosh**, *Section Editor* for "*Crystal Plasticity: Atomistics to Macroscale*" in ***Handbook of Materials Modeling***, 2nd edition, Methods: Theory and Modeling, Sidney Yip and Wanda Andreoni (editors), Springer International Publishing AG, Gewerbestrasse 11 6330 Cham, Switzerland, 2019.

4. **S. Ghosh** and C. A. Bronkhorst, ***Computational Mechanics,*** "Integrated Structure-Material Modeling," Vol. 61, No. 1-2, 2017.

5. C. A. Bronkhorst and **S. Ghosh**, ***International Journal of Fracture,*** "Integrated Computational Structure-Material Modeling of Deformation and Failure under Extreme Conditions". Vol. 208, 2017.

6. **S. Ghosh**, ***Materials,*** Computational Modeling and Simulation in Materials Study, 2013.

7. **S. Ghosh**, ***Computer Modeling in Engineering and Sciences,*** "Computational Materials Modeling," Vol. 5 (1-2), 2004.

8. A. K. Noor, S. E. Bechtel and **S. Ghosh**, ***International Journal of Solids and Structures,*** "Honoring the 70th birthday of Arthur W. Leissa," Vol. 40 (16), 2003.

9. **S. Ghosh** and R. E. Everett, ***Materials Science and Engineering A***, "Integrated Experimental-Computational Modeling of Advanced Materials," Vol. 249 (1-2), 1998.

♦ Book Chapters

1. **S. Ghosh**, "Machine learning-enabled parametrically upscaled constitutive models for bridging length scales in Ti and Ni alloys", in "***Innovative Lightweight and High-Strength Alloys***", Mohammed A. Zikry: (editor), Elsevier, May 2024, ISBN: 9780323995399, 9780323995405. https://doi.org/10.1016/B978-0-323-99539-9.00004

2. **S. Ghosh**, G. Weber, M. Pinz, A. Bagri, T. M. Pollock, W. Lenthe, J. C. Stinville, M.D. Uchic and C. Woodward, "Multi-Scale Microstructure and Property-based Statistically Equivalent RVEs for Modeling Nickel-based Superalloys", in "***Integrated Computational Materials Engineering (ICME): Advancing Computational and Experimental Methods***", **S. Ghosh**, C. Przybyla and C. Woodward (editors), pp. 55-90, Springer Nature Switzerland AG, March 2020, ISBN 978-3-030-40561-8.

3. **S. Ghosh,** D. V. Kubair, and C. Przybyla, "Microstructural Statistics Informed Boundary Conditions for Statistically Equivalent Representative Volume Elements (SERVE) of Polydispersed Elastic Composites", in "***Integrated Computational Materials Engineering (ICME): Advancing Computational and Experimental Methods***", **S. Ghosh**, C. Przybyla and C. Woodward (editors), pp. 297-328, Springer Nature Switzerland AG, March 2020, ISBN 978-3-030-40561-8.

4. W. Cai and **S. Ghosh**, "Recent Advances in Crystal Plasticity Modeling", in "***Crystal Plasticity: Atomistics to Macroscale***" in *Handbook of Materials Modeling, 2nd edition, Methods: Theory and Modeling*, Sidney Yip and Wanda Andreoni (editors), Springer International Publishing AG, Gewerbestrasse 11 6330 Cham, Switzerland, 2019.

5. **S. Ghosh** and M. A. Groeber, "Developing Virtual Microstructures and Statistically Equivalent Representative Volume Elements for Polycrystalline Materials", in "*Crystal Plasticity: Atomistics to Macroscale*" (section editors W. Cai and S. Ghosh) in ***Handbook of Materials Modeling, 2nd edition, Methods: Theory and Modeling***, (editors S. Yip and W. Andreoni), Springer International Publishing AG, Gewerbestrasse 11 6330 Cham, Switzerland, 2019.

6. **S. Ghosh**, "Advances in Computational Mechanics to Address Challenges in Crystal Plasticity FEM in "*Crystal Plasticity: Atomistics to Macroscale*" (section editors W. Cai and S. Ghosh) in ***Handbook of Materials Modeling, 2nd edition, Methods: Theory and Modeling***, (editors S. Yip and W. Andreoni), Springer International Publishing AG, Gewerbestrasse 11 6330 Cham, Switzerland, 2019.

7. X. Zhang, Z. Li, D. O'Brien, and **S. Ghosh**, "Parametrically Homogenized Continuum Damage Mechanics (PHCDM) Models for Composites from Micromechanical Analysis", The Minerals, Metals & Materials Series, Springer International, pp. 657-665, 2019.

8. J. Cheng and **S. Ghosh**, "Simulating Discrete Twin Evolution in Magnesium Using a Novel Crystal Plasticity Finite Element Model", ***Magnesium Technology 2017***, K. Solanki, D. Orlov, A. Singh, N.R. Neelameggham. (editors), The Minerals, Metals & Materials Series, Springer International, pp. 167-174, 2017.

9. **S. Ghosh** and P. Chakraborty, "Microstructure sensitive fatigue crack nucleation in Titanium alloys using accelerated crystal plasticity FE Simulations", ***Materials with Internal Structure***, P. Trovalusci (editors), Springer Tracts in Mechanical Engineering, Springer International Publishing Switzerland, pp. 43-62, 2016.

10. **S. Ghosh**, S. Keshavarz and G. Weber "Computational multiscale modeling of nickel-based Superalloys containing gamma-gamma' precipitates", ***Advanced Structural Materials, Vol. 57:*** *Inelastic Behavior of Materials and Structures under Monotonic and Cyclic Loading*, H. Altenbach and M. Brünig (editors), Springer, Vol. 57, pp. 67-96, 2015.

11. **S. Ghosh**, "Adaptive concurrent multi-level modeling of multi-scale ductile failure in heterogeneous metallic materials", ***Multiscale Modelling of Complex Materials:*** *Phenomenological, Theoretical and Computational Aspects*, T. Sadowsky and P. Trovalusci (editors.), CISM International Centre for Mechanical Sciences, Courses and Lectures, Vol. 556, pp. 59-106, Springer, Berlin. 2014.

12. P. Chakraborty and **S. Ghosh**, "Characterization of load sensitive fatigue crack initiation in Ti-Alloys using crystal plasticity-based FE simulations" in ***Advanced Materials Modelling for Structures, Advanced Structured Materials Series***, H. Altenbach and S. Kruch (editors), Springer, Vol. 19, pp 97-107, 2013.

13. **S. Ghosh** and P. Chakraborty, "Wavelet transformation induced multi-time scaling crystal plasticity FEM for cyclic deformation in polycrystalline materials" in ***Plasticity of Crystalline Materials:*** *From Dislocations to Continuum*, S. Bouvier, P. Franciosi, O. Cazacu and I. Ionescu (editors), pp. 209-243, Wiley, August 2011.

14. **S. Ghosh**, "Multi-Scale characterization and domain partitioning for multi-scale analysis of heterogeneous materials" in ***Computational Methods for Microstructure-Property Relationships***, **S. Ghosh** and D. Dimiduk (editors), pp. 99-150, Springer NY, January 2011.

15. **S. Ghosh**, M. Anahid and P. Chakraborty, "Modeling fatigue crack nucleation using crystal plasticity finite element simulations and multi-time scaling" in ***Computational Methods for Microstructure-Property Relationships***", **S. Ghosh** and D. Dimiduk (editors), pp. 497-554, Springer NY, January 2011.

16. **S. Ghosh** and M. Li, "Computational analysis of sheet shearing processes for process design" in ***ASM Handbook Volume 22B: Metals Process Simulation***, D. Furrer and L. Semiatin (editors), ASM International, October 2010.

17. **S. Ghosh**, "Adaptive concurrent multi-level model for multi-scale analysis of composite materials including damage" in ***Multiscale Modeling and Simulation of Composite Materials and Structures,*** Y. Kwon, D.H. Allen, and R. Talreja (editors), pp. 83-164, Springer, 2008.

18. M. Groeber, M. Uchic, D. Dimiduk, Y. Bhandari and **S. Ghosh** "Advances in computational modeling through the use of higher-level microstructure characterization" in ***High Performance Structures and Materials III,*** C. A. Brebbia (editors), Vol.: 85, pp. 331-341, WIT Press, 2006.

19. J. Williams and **S. Ghosh** "Thermo-mechanical processing improvements: Benefits and costs" in ***THERMEC'2003, PTS 1-5,*** T. Chandra, J.M. Torralba, T. Sakai, T (editors), Vol.: 426-4, pp. 4609-4615, Materials Science Forum, 2003. DOI: 10.4028/www.scientific.net/MSF.426-432.4609

♦ Articles in Scientific and Technology Magazines

2022 **S. Ghosh**, "Parametrically-Upscaled Constitutive Models (PUCM) with Uncertainty Quantification for Multiscale Modeling of Metals and Composite**s**", *IACM Expressions*: Magazine of the International Association of Computational Mechanics,

2016 **S. Ghosh**, "Multi-scale analysis of deformation and failure in polycrystalline titanium alloys under high strain rates", *Defense Tech Briefs*: Aerospace & Defense Technology, USA, December 2016.

2011 **S. Ghosh**, "Computational analysis framework for fatigue crack nucleation in metallic polycrystalline microstructures", *IACM Expressions*: Magazine of the International Association of Computational Mechanics, Vol. 29, pp. 25-32.

♦ Peer Reviewed Archival Journal Papers

- ***In Review/ Submitted for Publication***

1. Yilun Xu, Yu Cao, Zebang Zheng, Tawqeer Nasir Tak, Xiaochong Lu, Yang Liu, Kishore Nair, **Somnath Ghosh**, Fionn P.E. Dunne, "Life-constraining dwell fatigue in titanium aeroengine alloys: the role of temperature", *Nature Communications* (in review).

2. P. Tarafder, S. Dan and **S. Ghosh**, "Parametrically Upscaled Coupled Constitutive Damage Mechanics Model for Multiscale Analysis of Piezoelectric Composites", *Journal of Mechanics and Physics of Solids* (in review).

- ***Peer-Reviewed Archival Journal Publications***

1. **S. Ghosh**, S. Dan and P. Tarafder, "Machine Learning-Enabled Multiscale Modeling Platform for Damage Sensing Digital Twin in Piezoelectric Composite Structures", *Scientific Reports* (accepted for publication).

2. T. Montalbano, S. Nimer, M. Daffron, B. Croom, **S. Ghosh** and S. Storck, "Machine learning enabled discovery of new laser powder bed fusion processing domains for Ti-6Al-4V", *Additive Manufacturing* Art. 104632 (in press), 2024. https://doi.org/10.1016/j.addma.2024.104632

3. Yanrong Xiao, Deniz Ozturk and **S. Ghosh**, "Uncertainty-Quantified Parametrically Upscaled Continuum Damage Mechanics (UQ-PUCDM) Model from Microstructural Characteristics Induced Uncertainties in Unidirectional Composites", *Computer Methods in Applied Mechanics and Engineering*, Vol. 434, Art. 117571, February 2025. https://doi.org/10.1016/j.cma.2024.117571

4. T. Tak, K. Nair, V. Venkatesh, A. Pilchak and **S. Ghosh**, "Parametrically-Upscaled Constitutive and Crack Nucleation Models for Investigating the Effects of Specimen Geometry and Microstructure on Fatigue Crack Nucleation in Ti Alloys Containing Micro-Texture Regions", *Metallurgical & Materials Transactions A*, Vol. 55, pp. 4834–4851, 2024. (Editor's Choice) https://doi.org/10.1007/s11661-024-07587-2

5. T. Maloth, P. Appel, J. Erlebacher and **S. Ghosh**, "A Coupled Crystal Inelasticity-Phase Field Model for Crack Growth in Polycrystalline Nitinol Microstructures", *Modelling and Simulation in Materials Science & Engineering*, Vol 32, Art. 075001, 2024. https://doi.org/10.1088/1361-651X/ad6fbf

6. B. Murgas, J. Stickel, L. Brewer and **S. Ghosh**, "Modeling of complex polycrystalline alloys using a generative adversarial network enabled computational platform", *Nature Communications*, Vol. 15(1), pp. 9441, 2024. https://doi.org/10.1038/s41467-024-53865-3

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♦ Proceedings Publications

1. **S. Ghosh**, G. Weber, and M. Pinz, "A data-driven Bayesian model for fatigue in Ni-based superalloy microstructures", AIAA SCITECH 2023 Forum, 2023. doi: 10.2514/6.2023-2036

2. Z. Li and **S. Ghosh**, "Micromechanics model of the FRC subject to heating high- velocity impact using continuum damage mechanics with adiabatic heating", *Proceedings of the 34th Annual Technical Conference of the American Society for Composites*, K. Kalaitzidou (ed.), 2019. doi: 10.12783/asc34/31269

3. Md. Z. Alam, D. Eastman, G. Weber**, S. Ghosh** and K. Hemker, "Microstructural aspects of fatigue crack initiation and short crack growth in René 88DT", *Proceedings of the 13th International Symposium of Superalloys*, Superalloys, pp. 561-568, October 2016. doi: 10.1002/9781119075646.ch60**.**

4. X. Zhang, Z. Li, **S. Ghosh** and D. O'Brien, "Parametric Homogenization Based Continuum Damage Mechanics Model for Composites", *Proceedings of the 31st Annual Technical Conference of the American Society for Composites,* pp. 384-398, DEStech Publications, Inc., Lancaster PA 17602-4967, USA, 2016.

5. **S. Ghosh** and S. Keshavarz, "Multi-scale crystal plasticity FEM approach to modeling Nickel-based Superalloys", *55th AIAA/ASME/ASCE/AHS/SC Structures, Structural Dynamics, and Materials Conference: SciTech 2014*, January 2014. doi: 10.2514/6.2014-0796**.**

6. D. Paquet and **S. Ghosh**, "An adaptive multi-level model for multi-scale ductile fracture analysis in heterogeneous Aluminum alloys", *XII International Conference on Computational Plasticity. Fundamentals and Applications, COMPLAS XII,* E. Onate, D.R.J. Owen, D. Peric and B. Suarez (eds), January 2013**.**

7. **S. Ghosh** and M. Samal, "Physically motivated dislocation density-based multi-scale approach for constitutive modeling of γ–γ' Nickel based super-alloys", *Proceedings of NSF CMMI Grantees Conference,* January 2011**.**

8. **S. Ghosh**, "Multi-time scaling image based crystal plasticity FE models dwell fatigue initiation in polycrystalline Ti alloys", *Proceedings of the 1st World Congress on Integrated Computational Materials Engineering (ICME),* J. Allison, P. Collins, G. Spanos (eds.), The Minerals, Metals & Materials Society, pp. 113-119, 2011**.**

9. **S. Ghosh,** D. Paquet and P. Dondeti, "Microstructural effects on plastic deformation and fracture in dendritic cast Aluminum alloys", *Proceedings of NSF CMMI Grantees Conference,* January 2011**.**

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11. **S. Ghosh** and P. Chakraborty, "Modeling of dwell fatigue initiation in polycrystalline Ti alloys using multi-time scaling crystal plasticity FE models", *Proceedings of 10th International Conference on Computational Plasticity, COMPLAS X,* E. Onate and D.R.J. Owen (eds.), 2009.

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19. **S. Ghosh**, **"**Micromechanical and macroscopic models of ductile fracture in particle reinforced Aluminum'', *Proceedings of the International Congress on Computational Mechanics and Simulation*, D. Maiti and S.K. Dwivedi (eds.), IIT Guwahati Press, 2006.

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24. **S. Ghosh "**Modeling at the interface of mechanics and materials for composite and polycrystalline materials", *Proceedings ICTACEM 2004; Third International Congress on Theoretical, Applied, Computational and Experimental Mechanics*, S. Bhattacharyya and S. Ghosh (eds.), IIT Kharagpur Press, pp. 10-11, 2004.

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with debonding", *Materials Processing and Design: Modeling, Simulation and Application Proceedings of NUMIFORM*, S. Ghosh, J. Castro and J.K. Lee (eds.), AIP Publishers, pp. 1911-1917, 2004.

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33. D. Gardiner**, S. Ghosh** and M. Li**,** "Numerical simulations and experiments on the cold rolling process for Aluminum alloys", *Proceedings of NSF Design Grantees Conference*, January 2002.

34. **S. Ghosh** and P. Raghavan**,** "An adaptive multilevel computational model for composite laminates", *Proceedings of ICTACEM 2001*, Indian Institute of Technology, Kharagpur, India, December 2001.

35. **S. Ghosh** and P. Raghavan**,** "An adaptive multilevel computational model for composite laminates", Advances in Computational Engineering & Science, *Proceedings of International Conference on Computational Engineering Science*, S. N. Atluri (ed), 2001.

36. S. Yotte and **S. Ghosh,** "PMMC cluster analysis', modeling and simulation-based engineering", *Proceedings of International Conference on Computational Engineering Science*, S. N. Atluri (ed), 2001.

37. **S. Ghosh** and Y. Ling, "A microstructure based computational model for interfacial debonding in fiber reinforced composites", *Proceedings of SEM IX International Congress*, Orlando, FL, June 2000, pp. 65-68, 2000.

38. F. Susagna, S. Yotte, J. Riss, D. Breysse and **S. Ghosh**, "Covariance and spatial distribution of particles in a metal matrix composite", *Proceedings of MECAMAT 2000*, Centre De Morphologie Mathematique, Fontainebleau, France, 2000.

39. F. Susagna, S. Yotte, J. Riss, D. Breysse and **S. Ghosh**, "La covariance appliquee a l'analyse de la distribution spatialle de particules", *Proceedings of STERMAT 2000*, Sixth International Conference on Stereology and Image Analysis in Material Science, Krakow, Poland, 2000.

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41. Ch. PavanaChand and S**. Ghosh**, "A 3D Voronoi cell finite element model for particulate reinforced composites", *Modeling and Simulation Based Engineering*, S.N. Atluri and P.E. O'Donoghue (eds.), Tech Science Press, pp. 1450-1455, 1998.

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element method", *Proceedings of 14th US Army Symposium on Solid Mechanics*, K.R. Iyer and S-C. Chou (eds.), Battelle Press, pp. 3651-370, 1997.

44. **S. Ghosh**, "Multiple scale computational model for composite materials with microstructural damage", *Multiple Scale Analyses and Coupled Physical Systems*, J. Salencon (ed.), Presses de lecole nationale des, pp. 263-274, 1997.

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46. S. Moorthy and **S. Ghosh**, "Mesoscopic analysis of small deformation in heterogeneous materials using Voronoi cell finite element model", *Computational Mechanics' 95 Theory and Applications*, S. N. Atluri, G. Yagawa, and T. Cruse (eds.), pp. 1916-1921, 1995.

47. S. Raju and S. **Ghosh**, "Adaptive arbitrary Lagrangian-Eulerian finite element method for metal forming problems", *Computational Mechanics' 95 Theory and Applications*, S. N. Atluri, G. Yagawa, and T. Cruse (eds.), pp. 1414-1419, 1995.

48. S. Roy, **S. Ghosh** and R. Shivpuri, "FEM- micro genetic algorithm-based approach to optimal design of multistage metal forming processes", *NUMIFORM'95 Simulation of Materials Processing: Theory, Methods and Applications*, S.F. Shen and P. Dawson (eds.), Balkema Publishers, pp. 611-618, 1995.

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50. S. Moorthy, **S. Ghosh** and Y.S. Liu, "Voronoi cell finite element model for random micropolar elastic-plastic heterogeneous media", *Proceedings of 13th Army Symposium on Solid Mechanics*, S.C. Chou, F. D. Bartlett, T. W. Wright and K. Iyer (eds.), pp. 527-538, 1994.

51. **S. Ghosh** and S. Moorthy, "A Voronoi cell finite element model for random heterogeneous media", *Probabilities and Materials, Tests, Models and Applications, Proceedings of NATO Workshop PROBAMAT*, NATO ASI Series, Vol. 269, pp. 273-284, 1994.

52. R. Shivpuri, D. Damodaran, S**. Ghosh** and S. Roy, "Computer aided approaches to improved quality in the extrusion of shapes and drawing of tubes", *Proceedings of Tenth Annual World Tube Congress*, pp. 282-290 1994.

53. **S. Ghosh**, "Adaptive arbitrary Lagrangian-Eulerian finite element method in metal forming simulation", *MECAMAT' 91 Large Plastic Deformations*, Balkema Publishers, pp. 415-424, 1993.

54. **S. Ghosh**, "Heat transfer analysis of solidification processes by the Arbitrary Lagrangian-Eulerian finite element method", *Computational Methods in Materials Processing*, MD- Vol. 39, ASME, pp. 159-170, 1992.

55. **S. Ghosh** and S. Moorthy, "An arbitrary Lagrangian-Eulerian finite element model for heat transfer analysis of solidification processes", *Numerical Methods In Industrial Processes*, 92 J.L. Chenot, R.D. Wood and O.C. Zienkiewicz (eds.), Balkema Publishers, pp. 805-882, 1992.

56. **S. Ghosh**, "Finite deformation analysis involving contact of deformable bodies using the finite element

method with arbitrary Lagrangian-Eulerian description", *Computer Modeling and Simulation Of Manufacturing Processes*, MD- Vol.20, ASME, pp. 273-280, 1990.

57. **S. Ghosh**, "A new finite element description for simulation of metal forming processes", *NUMIFORM'89 Numerical Methods in Industrial Forming Processes*, E.G. Thompson, R.D. Wood, O.C. Zienkiewicz and A. Samuelsson (eds.), Balkema Publishers, pp. 157-163, 1989.

☐ PROFESSIONAL SHORT COURSES TAUGHT

2024 "Verification, Validation, and Uncertainty Quantification in the in the Computational Modeling of Materials and Structures", ***TMS online course***, (2 hours lecture), August 2024.

2014 "Integrated multi-scale characterization and modeling of ductile failure in heterogeneous metallic and composite materials", ***MM&FGM 2014*** *13th International Symposium on Multiscale, Multifunctional and Functionally Graded Materials*, Taua Resort, SP, Brazil, (four hours lecture), October 2014.

2012 "Integrated multi-scale characterization and modeling of ductile failure in heterogeneous materials" on Multiscale Modeling of Complex Materials", ***CISM (International Centre for Mechanical Sciences)*** short course, Udine Italy, (six hours lecture), May 2012.

2012 "Linking materials models with design models" ***ICME Course at AEROMAT***, Charlotte, NC, June 2012, (two hours lecture), June 2012.

☐ PRESENTATIONS AT CONFERENCES AND WORKSHOPS

♦ Plenary/ Semi-Plenary Lectures

1. **S. Ghosh**, (Plenary) "Machine Learning Enabled Parametrically Upscaled Constitutive and Damage Models (PUCM/PUCDM): A Data Driven Multiscale Modeling Approach for Metals & Composites", *4th International Conference on Mechanics of Advanced Materials and Structures (ICMAMS2024)*, Ramaiah Institute of Technology (RIT), Bangalore, India, December 11-13, 2024.

2. **S. Ghosh**, (Plenary) "Machine Learning Enabled Parametrically Upscaled Constitutive and Damage Models (PUCM/PUCDM): A Data Driven Multiscale Modeling Approach for Metals & Composites", *9th International Congress on Computational Mechanics and Simulation: ICCMS 2023*, Indian Institute of Technology Gandhinagar, India, December 20-22, 2023.

3. **S. Ghosh**, (*Plenary*) "Multiscale Models of Fatigue Life in Polycrystalline Ti Alloys from Location-Specific Statistically Equivalent RVEs (SERVE)", *2023 RTX Manufacturing Technology Network (MfgTN) and Additive Manufacturing Conference Joint Symposium*, East Hartford, Connecticut, November 6-7, 2023.

4. **S. Ghosh**, (*Plenary*) "Parametrically-Upscaled Constitutive Model (PUCM) and Crack Nucleation Model (PUCNM) for Fatigue Predictions in Ti Alloys", *3rd International Workshop on Plasticity, Damage and Fracture of Engineering Materials IWPDF 2023*, Istanbul Turkey, October 4-6, 2023.

5. **S. Ghosh**, (*Visioning Excellence Plenary Talk*) "Perspectives on Navigating the Emerging Landscape of Computational Mechanics", *US National Congress of Computational Mechanics,* Virtual Meeting, July 27, 2021.

6. **S. Ghosh**, (Plenary) "Parametrically Homogenized Constitutive Models (PHCMs) for Predicting Fatigue Crack Nucleation in Titanium Alloys: Coupling Multi-Scale Modeling with Machine Learning and Uncertainty Quantification", *ADMAT 2019, International Conference on Advanced Materials & Processes for Defence Applications*, Hyderabad, India, September 23-25, 2019.

7. **S. Ghosh**, (Plenary) "Parametrically Homogenized Constitutive Models (PHCMs) for Predicting Fatigue Crack Nucleation in Titanium Alloys: Coupling Multi-Scale Modeling with Machine Learning and Uncertainty Quantification", *ICM-13: 13th International Conference on the Mechanical Behaviour of Materials*, Melbourne, Australia June 2019.

8. **S. Ghosh**, (Plenary) "Computational Multiscale Framework for Coupled Transient Electromagnetic-Mechanical Phenomena for Antenna and Sensors", *ICCM2018 9th International Conference on Computational Methods*, Rome, Italy August 2018.

9. **S. Ghosh**, (semi-Plenary) "Multi-Scale Computational Models for Predicting Fatigue Crack Nucleation in Metallic Materials", *World Congress of Computational Mechanics WCCM XIII & PANACM II*, New York City, NY, July 22-27, 2018.

10. **S. Ghosh**, (Structural Materials Division Luncheon Lecture) "Advances in Computational Mechanics and Computational Materials Science for Multi-Scale Fatigue Prediction", *TMS2018 147th Annual Meeting and Exhibition*, Phoenix, AZ March 2018.

11. **S. Ghosh**, (Plenary) "Advanced Computing for Materials and Manufacturing", NSF Workshop on Core Knowledge and Skills for Effective Use of Advanced Computation and Data in Materials and Manufacturing", *TMS2018,* Phoenix, AZ March 2018.

12. **S. Ghosh**, "Parametrically Homogenized Damage Models from Micromechanical Analyses of Statistically Equivalent RVE's", *ICCMS 201, International Conference on Composite Materials and Structures,* December 27-29th 2017, Hyderabad, India.

13. **S. Ghosh**, "Computational Mechanics Approaches for Addressing the Integrated Computational Materials Engineering (ICME) Initiative", *8th International Conference on Multiscale Materials Modeling,* October 9-14, 2016, Dijon, France.

14. **S. Ghosh**, (semi-Plenary) "Computational Framework Involving Spatial and Temporal Multi-Scaling for Coupled Transient Electromagnetics-Mechanical Phenomena", *World Congress of Computational Mechanics WCCM XII & APCOM VI,* Seoul Korea, July, 2016.

15. **S. Ghosh**, "Spatial and Temporal Multiscale Models for Advancing Integrated Computational Materials Engineering", *EMI 2016 Conference & Probabilistic Mechanics & Reliability 2016 Conference,* Vanderbilt University, Nashville, TN, May 22-25, 2016.

16. **S. Ghosh**, (semi-Plenary) "Computational Mechanics in Advancing the Integrated Computational Materials Science & Engineering (ICMSE) Initiative for Metals and Alloys", *13th US National Congress of Computational Mechanics,* San Diego CA, July 27-30, 2015.

17. **S. Ghosh**, "Integrated Computational Materials Science & Engineering (ICMSE) Initiative in Predicting Deformation and Fatigue in Polycrystalline Metals and Alloys", *5th International Congress on Computational Mechanics and Simulation: ICCMS 2014,* CSIR-SERC Chennai, India, December 10-13, 2014.

18. **S. Ghosh**, "Integrated Computational Materials Science & Engineering Initiative in Predicting Deformation and Fatigue in Polycrystalline Alloys", *International Conference on Advanced Materials And Energy Technology, ICAMET,* IIEST Shibpur, India, December 17-19, 2014.

19. **S. Ghosh**, "Multi-Scale Computational Modeling System for Coupled Electromagnetics and Mechanical Simulations in Multifunctional Materials", *Multifunctional Materials, Structures and Applications: ICMMSA-2014,* Centre for Interdisciplinary Research (CIR), MNNIT, Allahabad, INDIA, December 22-24, 2014.

20. **S. Ghosh**, "New Paradigms in Multi-Scale Modeling for Integrated Computational Materials Science & Engineering (ICMSE)", *13th International Symposium on Multiscale, Multifunctional and Functionally Graded Materials MM&FGM 2014,* Taua Resort, SP, Brazil, October 19-22, 2014.

21. **S. Ghosh**, "Spatial and Temporal Multi-Scale Modeling of Heterogeneous Materials: Addressing the ICMSE Initiative", *Computational and Experimental Mechanics of Advanced Materials (CEMAM) Workshop,* KAUST, Saudi Arabia, July 1-3, 2013.

22. **S. Ghosh**, "New Trends in Simulation Based Engineering (SBE) with a Focus on Multi-Scale Modeling", *International Workshop on Scientific Computing - IWSC 2010,* Sri SATHYA SAI Institute of Higher Learning (SSSIHL), Prashanthi Nilayam, India, December 2010.

23. **S. Ghosh**, "Multi-Time Scale Crystal Plasticity FE Model for Cyclic Deformation and Crack Nucleation in Ti Alloys", *International Conference on Theoretical, Applied, Computational and Experimental Mechanics (ICTACEM),* Indian Institute of Technology, Kharagpur, India, December 2010.

24. **S. Ghosh**, "Predicting Ductile Failure in Structures: A Multi-Scale Approach", *9th International Conference on Structural Mechanics in Reactor Technology (SMIRT),* Toronto, Canada, August, 2007

25. **S. Ghosh**, "Multiscale Characterization and Modeling of Ductile Fracture in Cast Aluminum Alloys", *2nd International Conference on Computational Mechanics and Simulation*, I.I.T. Guwahati, India, December 2006.

26. **S. Ghosh**, "Crystal Plasticity Models with Multi-Time Scaling for Cyclic Deformation of Polycrystalline Metals", *Material Behaviour: Far From Equilibrium*, Bhabha Atomic Research Center, Mumbai, India, December 2006.

27. **S. Ghosh**, "Multi-Level Models for Multiple Scale Damage Analysis in Heterogeneous Materials", *34th Solid Mechanics Conference*, Zakopane, Poland, September 2002.

♦ Keynote Lectures

1. **S. Ghosh,** "Modeling Location-specific Material Behavior in Polycrystalline Ti Alloys With Material Design Implications"*, TMS Specialty Congress: Accelerating Discovery for Mechanical Behavior of Materials 2024: Mechanical Behavior Keynote* , Cleveland OH, June 17, 2024.

2. **S. Ghosh,** "Parametrically Upscaled Constitutive and Crack Nucleation Models (PUCM/PUCNM)"*, PW-24 (Cold Dwell Fatigue in Titanium Alloys) Workshop,* Dayton OH, April 19, 2024.

3. **S. Ghosh,** "Data-Driven Parametrically-Upscaled Coupled Constitutive and Damage Models for Damage Sensing in Multifunctional Piezo-Composites"*, 3rd International Conference on Mechanics of Advanced Materials and Structures,* Texas A&M University, College Station TX, August 9-10, 2023.

4. **S. Ghosh,** "Machine Learning Enabled Parametrically Upscaled Constitutive Models (PUCM): A Data Driven Multiscale Modeling Approach for Metals & Composites"*, Data-Driven and Computational Modeling Across Scales,* California Nano Systems Institute, UCLA, May 10-12, 2023.

5. **S. Ghosh,** "Machine Learning-Enabled and Uncertainty Quantified Parametrically-Upscaled Constitutive Models for Multiscale Fatigue Modeling"*, 10th International Conference on Multiscale Materials Modeling (MMM10),* Baltimore MD, October 3, 2022.

6. **S. Ghosh,** "Data-driven Bayesian Model-based Prediction of Fatigue Crack Nucleation in Ni-based Superalloys"*, Computing In Engineering Forum 2022, Virtual Event,* University of Wisconsin, Madison, WI, September 20 – 21, 2022.

7. **S. Ghosh,** "Crystal Plasticity Phase Field Model with Crack Tip Enhancement By Concurrent Atomistic-Continuum Model"*, 11th European Solid Mechanics Conference (ESMC),* University of Galway, Galway, Ireland July 4-8, 2022.

8. **S. Ghosh**, "Uncertainty Quantified Parametrically Homogenized Constitutive Models (UQ-PUCM) for Predicting Fatigue Crack Nucleation in Ti Alloys"*, TMS 2022 Annual Meeting & Exhibition,* Anaheim, CA, February 28, 2022.

9. **S. Ghosh,** "WATMUS: Wavelet Transformation Induced Multi-Time Scaling for Accelerating Fatigue and Multi-Physics Simulations", *J.T. Oden Symposium, US National Congress of Computational Mechanics, Virtual Meeting,* July 27, 2021.

10. **S. Ghosh,** "Uncertainty Quantified Parametrically Homogenized Constitutive Models (PHCMs) for Multi-Scale Predictions of Fatigue Crack Nucleation in Titanium Alloys", *Imperial College Titanium Industry Meeting, Virtual Meeting,* October 22, 2020.

11. **S. Ghosh,** "Uncertainty Quantified Parametrically Homogenized Constitutive Models (PHCMs) for Multi-Scale Predictions of Fatigue Crack Nucleation in Titanium Alloys", *Computing In Engineering Forum 2020, Virtual Event,* University of Wisconsin, Madison, WI, September 29 – October 1, 2020.

12. **S. Ghosh,** Preetam Tarafder and Saikat Dan, "Towards a Virtual Damage Sensor: Using a Multiscale Coupled Electro-Mechanical FE Model of Piezoelectric Material", *TMS 2020 Annual Meeting & Exhibition,* San Diego, CA, February 23-27, 2020.

13. **S. Ghosh,** "Parametrically Homogenized Constitutive Models (PHCM) from Image-based Crystal Plasticity Modeling to Predict Fatigue Crack Nucleation", *SES 2019, Society of Engineering Science: 56th Annual Technical Meeting,* Washington University in St. Louis, October 13-15, 2019.

14. **S. Ghosh,** "Coupling CPFEM with Phase Field Modeling from Crack Propagation in Polycrystalline Materials", *15th US National Congress of Computational Mechanics*, Austin TX, July 28-August 1, 2019.

15. **S. Ghosh**, "Coupled Atomistic-Continuum Coupling for Crack Propagation", *NIST Workshop on Atomistic Simulations for Industrial Needs*, Gaithersburg, MD, August 2, 2018.

16. **S. Ghosh**, "Crystal Plasticity Finite Element Simulation of Fatigue Failure in Polycrystalline Al7075-T651", *EMI 2018: Engineering Mechanics Institute Conference,* Cambridge, MA, May 30, 2018.

17. **S. Ghosh**, "High Fidelity Modeling of Multi-Physics Material Damage Initiation and Evolution", *Advances in Structural Sciences Research for High-speed Flight,* The Ohio State University, Columbus, Ohio, March 14 - 16, 2018.

18. **S. Ghosh**, "Development of a Multi-Scale Modeling Framework for Fatigue Crack Evolution in Ti Alloys", *MAI PW-18*, Dayton, OH, February 15, 2018.

19. **S. Ghosh**, "Wavelet Transformation based Multi-Time Scaling (WATMUS) for Fatigue and Coupled Multi-Physics Problems", *Symposium on Multiscale Computational Analysis of Complex Materials,* Technical University of Denmark (DTU), Lyngby, Denmark, August 29-31, 2017.

20. **S. Ghosh**, "Spatial and Temporal Multiscale Models for Advancing the Integrated Computational Structure-Materials Engineering Initiative", *Workshop on Materials Computation Data Science & Multiscale Modeling*, University of Illinois Urbana Champaign, August 14-15, 2017.

21. **S. Ghosh**, "Computational Framework Involving Temporal Multi-Scaling for Coupled Transient Electromagnetics-Mechanical Phenomena", 14th *US National Congress on Computational Mechanics,* Montreal, Canada, June 17-20, 2017.

22. **S. Ghosh**, "Computational Framework Involving Temporal Multi-Scaling for Coupled Transient Electromagnetics-Mechanical Phenomena", *EMI 2017: Engineering Mechanics Institute Conference*, San Diego, CA, June 4-7, 2017.

23. **S. Ghosh**, "ICME and Computational Mechanics for Advancing Predictive Capabilities in Fatigue Modeling", *TMS 2017 146th Annual Meeting & Exhibition*, San Diego, CA, February 27, 2017.

24. **S. Ghosh**, "Computational Framework for Coupled Transient Electromagnetics-Mechanical Phenomena", *ARSM 2016: Multiferroic Meso-Micro RF Devices*, University of California, Los Angeles, November 15, 2016.

25. **S. Ghosh**, "Computational Mechanics Aspects for Advancing the Integrated Computational Materials Engineering (ICME) Initiative", *IUTAM Symposium on Integrated Computational Structure-Material Modeling of Deformation and Failure under Extreme Conditions*, Baltimore, Maryland, June 20-22, 2016.

26. **S. Ghosh**, "High Fidelity Modeling of Multi-Scale Material Damage Initiation and Evolution", *Advances in Structural Sciences Research for High-speed Flight*, The Ohio State University, Columbus, Ohio, 10 - 13 May 2016.

27. **S. Ghosh**, "Multi-Scale Modeling Computational Framework for Evolving Damage in Composite Materials & Structures", ARO *Workshop for High-Fidelity Simulation Based Virtual Testing of Composite Materials and Structures*, Coral Gables, FL. April 19-20, 2016.

28. **S. Ghosh**, "FAA Cold Dwell Program: Review of Computational Modeling", *Workshop on Cold Dwell Fatigue of Titanium Alloys*, Tec Edge, Dayton OH, April 18-19, 2016.

29. **S. Ghosh**, "Facilitating Physics-based Materials Modeling with ICME Approaches", *NASA's 2040 Vision for Integrated, Multiscale Materials and Structures Modeling/Simulation Workshop*, Nashville, Tennessee, February 18, 2016.

30. **S. Ghosh**, "Multi-Scale Crystal Plasticity FE Models for Predicting Fatigue in Polycrystalline Metals and Alloys", *TMS 2016 144th Annual Meeting & Exhibition*, Nashville, Tennessee, February 14-18, 2016.

31. **S. Ghosh**, "An Integrated Spatio-Temporal Multi-Scale Computational Modeling System", *Gordon Research Conference on Multifunctional Materials and Structures: Science of Autonomic, Adaptive and Self-Sustaining Systems*, Ventura, California, January 31- February 5, 2016.

32. **S. Ghosh** and J. Cheng, "Multi-Scale Crystal Plasticity FE Models for Predicting Fatigue in Polycrystalline Metals and Alloys", *Plasticity 2016*, Kona, Hawaii, January 3-9, 2016.

33. **S. Ghosh**, "Multi-Scale Computational Modeling Framework for Coupled Electromagnetics and Mechanical Simulations in Multifunctional Materials", *20th International Conference on Composite Materials*, Copenhagen, Denmark, July 19-24, 2015.

34. **S. Ghosh**, "Multi-Scale Crystal Plasticity FE Models for Predicting Fatigue in Polycrystalline Metals and Alloys", *2015 ASM Annual Symposium*, GE Global Research, Niskayuna, NY, May 18-19, 2015.

35. **S. Ghosh**, (panelist and speaker) "Integrated Computational Materials Engineering for Composite Materials: An Academic Perspective", *SAMPE 2015*, Baltimore, MD, May 19, 2015.

36. **S. Ghosh**, S. Keshavarz, G. Weber, "Multi-Scale Crystal Plasticity FEM Approach to Modeling Nickel-Based Superalloys", *TMS 2015 144th Annual Meeting & Exhibition,* Orlando, FL, March 15-19, 2015.

37. **S. Ghosh**, "Spatial and Temporal Multi-Scale Modeling of Lightweight Metallic Materials: Addressing the ICMSE Initiative", *2nd Light-Weighting Summit Advances in Materials for Automotive Mass Reduction,* Detroit, MI, March 3-5, 2015.

38. **S. Ghosh**, "Multi-Time Scaling Induced Image Based Crystal Plasticity FE Models for Predicting Fatigue in Polycrystalline Alloys", *11th World Congress on Computational Mechanics WCCM-ECCM-ECFD 2014,* Barcelona, Spain, July 21-25, 2014.

39. **S. Ghosh**, "Material Constitutive and Damage Modeling for Extreme Environments", *AFRL Collaborative Center for Structural Sciences Meeting,* Tec-Edge, Dayton, OH, July 7 –10, 2014.

40. **S. Ghosh**, "Towards a Multi-Scale Framework for Predicting Fatigue in Polycrystalline Metals and Alloys", *3rd Multi-axial/Multiscale Fatigue Summit,* Old Town Alexandria, VA, June 10-12, 2014.

41. **S. Ghosh**, "Center of Excellence in Integrated Materials Modeling (CEIMM)", AFRL Workshop on *Enhancing DoD Collaborations in Computational Materials Science and Engineering,* Dayton, OH, June 3-4, 2014.

42. **S. Ghosh**, "Hierarchical Crystal Plasticity FEM For Polycrystalline Nickel-based Superalloys", *IUTAM Symposium on Connecting Multiscale Mechanics to Complex Material Design,* Evanston, Ill, May 13-15, 2014.

43. **S. Ghosh**, "Modeling at the Meso-scale: Issues and Needs for Multi-Scale Modeling of Material Failure", *Mach Conference,* Annapolis, MD, April 2014.

44. **S. Ghosh**, "Benchmark Problems for Predictive Material Behavior, Part 2: Failure Problems", *SIAM Conference on Uncertainty Quantification,* Savannah, Georgia, April 2014.

45. **S. Ghosh** and S. Keshavarz, "Multi-Scale Crystal Plasticity FEM Approach to Modeling Nickel-based Superalloys", *American Institute of Aeronautics and Astronautics (AIAA) SciTech Conference,* National Harbor, MD, January 2014.

46. **S. Ghosh** and S. Keshavarz**,** "Multi-Scale Crystal Plasticity FEM Approach to Modeling Nickel-based Superalloys", *Plasticity, Damage & Fracture 2014,* Grand Lucayan Resort, Freeport, Bahamas, January 2014.

47. **S. Ghosh,** "Integrated Computational Materials Science & Engineering (ICMSE) Approaches to Problems with Evolving Domains", *Workshop on Computational Methods for Problems with Evolving Domains and Discontinuities,* AHPCRC, Stanford University, CA, December 4-5, 2013.

48. **S. Ghosh,** "Integrated Multi-Scale Characterization and Modeling of Ductile Failure in Heterogeneous Materials", ASME *International Mechanical Engineering Congress & Exposition 2013,* San Diego, CA, November 20, 2013.

49. **S. Ghosh,** "Multi-Time Scaling Induced Image Based Crystal Plasticity FE Models for Predicting Fatigue in Polycrystalline Alloys", ASME *International Mechanical Engineering Congress & Exposition 2013,* San Diego, CA, November 20, 2013.

50. **S. Ghosh,** "Challenges in Integrated Computational Structure-Material Modeling of High Strain-Rate Deformation and Failure in Heterogeneous Materials", *ARO-Sponsored Workshop,* Johns Hopkins University, Baltimore MD, September 5-6, 2013.

51. **S. Ghosh,** "Integrated Multi-Scale Characterization and Modeling of Ductile Failure in Metallic Alloys", *EMI 2013: Engineering Mechanics Institute Conference*, Northwestern University, August 5-7, 2013.

52. **S. Ghosh,** "Developing Crystal Plasticity Constitutive and Image-Based FE Models for Polycrystalline Magnesium Alloys", *Workshop on Multi-Axial Loading in Magnesium Alloys*, University of Waterloo, Canada, April 11-12, 2013.

53. **S. Ghosh,** "Multi-Time Scaling Image -Based CPFE Models for Fatigue Initiation in Polycrystalline Ti Alloys", TMS 2013 *142nd Annual Meeting and Exhibition,* San Antonio TX, March 2013.

54. **S. Ghosh,** "Integrated Multi-Scale Characterization and Modeling of Ductile Failure in Aluminum Alloys", *49th Annual Meeting of Society of Engineering Science*, Atlanta GA, October 2012.

55. **S. Ghosh,** "Wavelet Transformation Multi-Time Scaling for Fatigue Crack Initiation in Polycrystalline Ti Alloys", *10th World Congress on Computational Mechanics,* Sao Paulo, Brazil, July 2012.

56. **S. Ghosh,** "Image-Based Multi-Scale Models in Ductile Failure and Fatigue of Heterogeneous Metallic Materials", *MDI Summer Research Group Workshop Damage Evolution in Structural Materials at the Mesoscale: Models and Experiments*, Los Alamos National Laboratory, NM, July 2012.

57. **S. Ghosh,** "Homogenization Based Continuum Damage Mechanics Model for Monotonic and Cyclic Damage in 3D Composites", *IUTAM Symposium on Advanced Materials Modeling for Structures*, Ecole des Mines de Paris, France, April 2012.

58. **S. Ghosh,** "Multi-time Scaling in Fatigue Analysis of Image Based Crystal Plasticity FEM", *Averaging Methods for Multiscale Phenomena in Engineering Materials Workshop,* Carnegie Mellon University, Pittsburgh, PA, April 2012.

59. **S. Ghosh,** "Temporal Multi-Scaling in Crystal Plasticity FE Models of Polycrystalline Metals for Fatigue Crack Initiation", *J.T. Oden 75th Birthday Symposium,* University of Texas, Austin, TX, January 2012.

60. **S. Ghosh,** "Multi-Time Scaling Image Based Crystal Plasticity FE Models Dwell Fatigue Initiation in Polycrystalline Ti Alloys", *Plasticity 2012,* San Juan, Puerto Rico, January 2012.

61. **S. Ghosh**, "Computational Multi-scale Methods for Damage and Failure in Heterogeneous Materials", *Air Force Workshop on Ceramic Matrix Composites Behavior and Life Modeling,* Dayton, OH, August 3-4, 2011.

62. **S. Ghosh**, "Multi-Scale Modeling of Deformation and Failure in Poly-phase and Polycrystalline Materials", *11th US National Congress of Computational Mechanics,* Minneapolis, MN, July 2011.

63. **S. Ghosh**, "Computational Multi-scale Methods for Damage and Failure in Heterogeneous Materials", *Air Force Workshop on High-rate Deformation Physics of Heterogeneous Materials,* Arlington, VA, July 2011.

64. **S. Ghosh**, "Multi-Time Scaling Based Crystal Plasticity FE Models of Dwell Fatigue Initiation in Polycrystalline Ti Alloys", *1st World Congress on Integrated Computational Materials Engineering,*

Seven Springs Mt Resort, PA, July 2011.

65. **S. Ghosh**, "Multi-Time Scaling Image Based Crystal Plasticity FE Models Dwell Fatigue Initiation in Polycrystalline Ti Alloys", *Uncertainty Quantification and Multiscale Materials Modeling*, Santa Fe, New Mexico, June 2011.

66. **S. Ghosh**, "Challenges in Computational Multiscale Materials Modeling", *Joint ARO-AFOSR-NSF Workshop on Multiscale, Multiphysics Analysis & Design For Multifunctional Applications*, Arlington, VA, May 2011.

67. **S. Ghosh**, "Multiscale Modeling for Multifunctional Design", *Joint ARO-AFOSR-NSF Workshop on Multiscale, Multiphysics Analysis & Design For Multifunctional Applications*, Arlington, VA, May 2011.

68. **S. Ghosh**, "Temporal Multi-scaling in Image Based Crystal Plasticity FE Modeling of Dwell Fatigue in Ti Alloys Fatigue", *IUTAM Symposium*, Pensacola, Florida, April 2011.

69. **S. Ghosh**, "Computational Modeling Framework for Coupled Electro-Magnetic-Dynamical –Damage Systems", *Integrated Sensor Technologies & Electromagnetic Interference Workshop*, University of California LA, October 6, 2010.

70. **S. Ghosh**, "Crack Nucleation in Ti Alloys under Dwell Loading with Wavelet based Multi-Time Scale Approach", *9th World Congress of Computational Mechanics (WCCM/APCOM2010)*, Sydney, Australia, July 19-23, 2010.

71. **S. Ghosh**, "The Voronoi Cell Finite Element Method: Advances in Microstructural Damage & Failure", *9th World Congress of Computational Mechanics (WCCM/APCOM2010)*, Sydney, Australia, July, 2010.

72. **S. Ghosh**, "Multi-Scale Approaches for Modeling Failure and Fatigue in Composite Materials", *High Resolution Non-Invasive Damage Diagnostics & Predictive Modeling Workshop*, London, England, June 1-3, 2010.

73. **S. Ghosh**, "Dwell Fatigue Initiation in Polycrystalline Ti Alloys Using Multi-Time Scaling Crystal Plasticity FE Models", *High Resolution Non-Invasive Damage Diagnostics & Predictive Modeling Workshop*, London, England, June 1-3, 2010.

74. **S. Ghosh**, "Dwell Fatigue Initiation in Polycrystalline Ti Alloys Using Multi-Time Scaling Crystal Plasticity FE Models", *Rolls-Royce Crystal Plasticity Modeling and Related Technology Workshop*, Indianapolis, January 11-12, 2010

75. **S. Ghosh,** D. Joseph, P. Chakraborty, "Dwell Fatigue Initiation in Polycrystalline Ti Alloys Using Multi-Time Scaling Crystal Plasticity FE Models", *16th International Symposium on Plasticity*, St. Kitts, January 3-8, 2010.

76. **S. Ghosh,** A. Srivastava, C. Alleman, "MD Simulations for Physical Property Estimation in Polymeric Systems", *Ohio Innovation Summit*, Dayton, OH, April 20, 2009.

77. **S. Ghosh**, "Integrated Multiscale Characterization-Analysis for Ductile Fracture in Heterogeneous Metallic Materials", *3rd US-France Symposium on Damage and Failure in Heterogeneous Materials and Structures*, University of Florida/REEF, Shalimar, FL, 22-24 April 2009.

78. **S. Ghosh**, D. Paquet, J. Bai and H. Chao, "Multiscale Characterization and Analysis for Ductile Fracture

in Metallic Materials", *15th International Symposium on Plasticity & Its Current Application*, St. Thomas, US Virgin Islands, January 3-8, 2009.

79. **S. Ghosh,** "Multi-level Models for Multi-Scale Analysis of Failure and Fatigue of Composite Materials", *AFOSR Workshop on Multiscale Computational Methods for Complex Materials*, Boston, MA, November 2008.

80. **S. Ghosh,** D. S. Joseph and P. Chakraborty, "Crystal Plasticity Models with Multi-time Scaling for Cyclic Deformation of Polycrystalline Metals", *4th Multi-scale Materials Modeling Conference, Tallahassee, FL, October 2008*.

81. **S. Ghosh** and S. Manchiraju, "Crystal Plasticity Models with Multi-time Scaling for Cyclic Deformation of Polycrystalline Metals", *International Conference in Plasticity'07*, Anchorage, Alaska June 2007.

82. **S. Ghosh**, "Crystal Plasticity Models for Deformation of Polycrystalline Ti Alloys", *DARPA Prognosis Meeting*, St. Augustine, FL, January 29, 2007.

83. **S. Ghosh** and S. Manchiraju, **"**Multi-Time Scale Analysis of Cyclic Deformation in Polycrystalline Metals", *3rd Multi-scale Materials Modeling Conference*, Freiburg, Germany, September 2006.

84. M. Groeber. **S. Ghosh**, **"**A Framework for Automated 3D Microstructural Analysis & Representation", *3rd Multi-scale Materials Modeling Conference*, Freiburg, Germany, September 2006.

85. **S. Ghosh**, "Multi-Scale Material Characterization and Multi-scale Analysis of Ductile Fracture in Cast Aluminum Alloys", *7th World Congress of Computational Mechanics*, Los Angeles, CA, July 2006.

86. **S. Ghosh**, "Computational Multi-scale Models for Structure-Material Interaction", *AFOSR Workshop on Multiscale Modeling of Carbon Fiber Reinforced Composites*, Long Beach, CA, May 2006.

87. **S. Ghosh**, "Computational Multi-scale Models for Structure-Material Interaction", *Mechanics of Materials Workshop*, Mathematisches Forschungsinstitut, Oberwolfach, Germany, January 2006.

88. **S. Ghosh**, "Computational Modeling of Ti-6242 from Experiments", *Residual Stress Meeting*, GE Aircraft Engines Company, Cincinnati, OH, February 2006.

89. **S. Ghosh** and M. Asai, "Multiple Time Scale Modeling of Cyclic Deformation with Crystal Plasticity", *8th US National Congress of Computational Mechanics*, Austin, TX, July 2005.

90. **S. Ghosh**, "Multiple Time Scale Modeling of Cyclic Deformation with Crystal Plasticity", *3rd International Conference on Structural Stability & Dynamics*, Kissimmee, FL, June 2005.

91. **S. Ghosh**, "Finite Element Modeling of Deformation in Metals with Crystal Plasticity", *Workshop on Integration of Characterization, Modeling and Rapid Manufacturing*, Freiburg, Germany, May 2005.

92. **S. Ghosh**, **"**Concurrent Multi-Scale Computational Models for Structure-Material Interaction", *Ohio Supercomputer Center on Materials for National Security*, Santa FE, NM, May 2005.

93. **S. Ghosh** "Multiple Scale Modeling for Deformation and Failure of Heterogeneous Materials", *International Congress on Computational Mechanics and Simulation*, Indian Institute of Technology, Kanpur, December 2004.

94. **S. Ghosh** "Modeling at the Interface of Mechanics and Materials for Composite and Polycrystalline

Materials", *ICTACEM 2004; Third International Congress on Theoretical, Applied, Computational and Experimental Mechanics*, Indian Institute of Technology, Kharagpur, December 2004.

95. **S. Ghosh,** P. Raghavan and S. Li, "Multi-Level Computational Models for Multiple Scale Analysis of Composite Materials", *International Workshops on Advances in Computational Mechanics: IWACOM*, Hosei University, Tokyo, Japan, November 2004.

96. **S. Ghosh**, "Multi-Scale Modeling of Composites and Polycrystalline Materials", *6th World Congress of Computational Mechanics: WCCM*, Beijing, China, September 2004.

97. **S. Ghosh** and P. Raghavan**,** "Multi-Level Models For Damage Analysis in Composite Materials*", 7th US National Congress of Computational Mechanics*, Albuquerque, NM, July 2003.

98. **S. Ghosh** and P. Raghavan**,** "Adaptive Multi-Level Models For Damage Analysis in Composite Materials*", International Conference on Computational Engineering Science ICES 2003,* Corfu, Greece, July 2003.

99. **S. Ghosh,** "Multilevel Models for Multiple Scale Analysis of Composite Materials", *Annual Symposium in the Computational Science & Engineering Program*, The University of Illinois, Urbana-Champaign, IL, April 2003

100. **S. Ghosh,** "Multilevel Computational Model for Composite Laminates", *2nd International Conference on Theoretical, Computational and Experimental Mechanics*, Indian Institute of Technology, Kharagpur, December 2001.

101. **S. Ghosh,** (Section lecture) "An Adaptive Multilevel Computational Model for Composite Laminates", *2nd International Conference on Theoretical, Computational and Experimental Mechanics*, Indian Institute of Technology, Kharagpur, December 2001

102. **S. Ghosh**, "An Adaptive Multilevel Computational Model for Composite Laminates", *International Conference on Computational Engineering Science ICES 2001,* Puerto Vallarta, Mexico, August 2001.

103. **S. Ghosh**, "Multi-level Models for Multiple Scale Damage Analysis in Heterogeneous Materials", *33rd Solid Mechanics Conference*, Zakopane, Poland, September 2000.

104. **S. Ghosh**, "Incorporation of Microstructural Simulations into FEM Modeling of Damage and Properties", *2000 Gordon Conference on Physical Metallurgy on Processing for Control of Microstructure Evolution and Performance,* Plymouth, NH, July 2000.

105. **S. Ghosh**, "Multiple Scale Analysis of Heterogeneous Elastic-Plastic Materials with Asymptotic Homogenization and the Voronoi Cell Finite Element Method", *5th International Workshop on Computational Modeling of the Mechanical Behavior of Materials*, Aachen, Germany, November 1995.

♦ Invited Paper Presentations

1. **S. Ghosh**, "Machine Learning-Augmented Parametrically Upscaled Damage Model for Microstructural Damage Sensing in Piezoelectric Composites", Drucker Medal Symposium Honoring Professor Arun Shukla, *ASME IMECE 2024,* Portland, OR, November 17-21, 2024.

2. **S. Ghosh**, "Machine Learning Enabled Parametrically Upscaled Constitutive Models for Fatigue Simulations: A Data-Driven Multiscale Modeling Approach", *MS&T 2024 Materials Science & Technology*, Pittsburgh, PA, October 6-9, 2024.

3. A.D. Rollett and **S. Ghosh**, "Towards a Digital Twin for Qualification and Certification of Metals Additive Manufacturing", *MS&T 2024 Materials Science & Technology*, Pittsburgh, PA, October 6-9, 2024.

4. **S. Ghosh**, "Multiscale Modeling of Multifunctional Composites Using Parametric Upscaling Multiscale Modeling of Multifunctional Composites Using Parametric Upscaling", *Shaping the Future of Multifunctional Materials and Structures: A Symposium in Honor of Dr. 'Les' Lee*," Johns Hopkins University, Baltimore, MD, September 19-20, 2024.

5. **S. Ghosh** and Kishore Nair, "Crystal plasticity phase field model with crack tip enhancement by concurrent atomistic-continuum model", *16th World Congress on Computational Mechanics and 4th Pan American Congress on Computational Mechanics (WCCM-PANACM 2024),* Vancouver, Canada, July 22-25, 2024.

6. **S. Ghosh** and G. Weber, "Data-Driven Bayesian Model-Based Prediction of Fatigue Crack Nucleation in Ni-based Superalloys", *16th World Congress on Computational Mechanics and 4th Pan American Congress on Computational Mechanics (WCCM-PANACM 2024),* Vancouver, Canada, July 22-25, 2024.

7. **S. Ghosh**, S. Dan and P. Tarafder, "Machine learning-aided digital twins for damage sensing: a multi-physics and multi-scale computational framework using piezoelectric composites", *16th World Congress on Computational Mechanics and 4th Pan American Congress on Computational Mechanics (WCCM-PANACM 2024),* Vancouver, Canada, July 22-25, 2024.

8. T. Tak, K. Nair, S. Kotha, A. Pilchak, and **S. Ghosh**, "Multiscale modeling and simulation platform for predicting cold dwell fatigue in Ti alloys *", 16th World Congress on Computational Mechanics and 4th Pan American Congress on Computational Mechanics (WCCM-PANACM 2024),* Vancouver, Canada, July 22-25, 2024.

9. **S. Ghosh**, S. Dan and P. Tarafder, "Machine learning-augmented parametrically upscaled damage model for microstructural damage sensing in piezoelectric composites", *Engineering Mechanics Institute Conference and Probabilistic Mechanics & Reliability Conference (EMI/PMC),* Chicago, Ill, May 28-31, 2024.

10. Y. Xiao and **S. Ghosh**, "Bayesian UQ framework for multiscale Parametrically Upscaled Continuum Damage Mechanics Model (PUCDM) of unidirectional composites", *Engineering Mechanics Institute Conference and Probabilistic Mechanics & Reliability Conference (EMI/PMC),* Chicago, Ill, May 28-31, 2024.

11. **S. Ghosh,** Parametrically-upscaled Crack Nucleation Model (PUCNM) for Fatigue Nucleation in Ti Alloys Containing Micro-Texture Regions, *TMS 2024 Annual Meeting & Exhibition*, March 3-7, 2024, Orlando, Florida.

12. **S. Ghosh,** Efficient Computational Framework for Image-based Micromechanical Analysis of Additively Manufactured Ti-6Al-4V Alloys, *An Atoms to Autos Approach for Materials Innovations for Lightweighting: An LMD Symposium in Honor of Anil K. Sachdev TMS 2024 Annual Meeting & Exhibition*, March 3-7, 2024, Orlando, Florida.

13. **S. Ghosh,** "Machine Learning Enabled Parametrically Upscaled Constitutive Models (PUCM): Data Driven Multiscale Modeling Approach for Metals & Composites", *Advances in Computa1onal Mechanics (ACM 2023),* University of Texas, Austin, October 24, 2023.

14. **S. Ghosh,** "Data-Driven Bayesian Model-Based Prediction of Fatigue Crack Nucleation in Ni-based Superalloys", *3rd International Conference on Mechanics of Advanced Materials and Structures*, Texas A&M University, College Station TX, August 9-10, 2023.

15. **S. Ghosh**, P. Tarafder, S. Dan, "Multiscale Modeling and Machine Learning-Enabled Digital Twin for Piezocomposite Damage Sensing", *TMS ICME 2023 7th World Congress*, May 21–25, 2023, Orlando, Florida.

16. **S. Ghosh**, D. Furrer, A. D. Rollett, "Model-Based Material and Process Definitions (MBMPD) for Additive Component Design and Qualification", *TMS ICME 2023 7th World Congress*, May 21–25, 2023, Orlando, Florida.

17. **S. Ghosh**, D. Ozturk, J. Shen, "Parametrically-Upscaled Crack Nucleation Model (PUCNM) for Fatigue Nucleation in Ti Alloys Containing Micro-Texture Regions", *TMS ICME 2023 7th World Congress*, May 21–25, 2023, Orlando, Florida.

18. B. Murgas, J. Stickel and **S. Ghosh**, "A Generative Adversarial Network (GAN) for the Creation of Complex 3D Bimodal Polycrystalline Microstructures: Application to Cold-Spray Al7050 Alloy", *TMS ICME 2023 7th World Congress*, May 21–25, 2023, Orlando, Florida.

19. B. Murgas, J. Stickel and **S. Ghosh**, "A Generative Adversarial Network (GAN) for the Creation of Complex 3D Bimodal Polycrystalline Microstructures: Application to Cold-Spray Al7050 Alloy", Poster, *Data-Driven and Computational Modeling Across Scales*, California Nano Systems Institute, UCLA, May 10-12, 2023.

20. P. Tarafder, S. Dan and **S. Ghosh**, "A Machine Learning Aided Digital Twin for Damage Sensing based on a Multiphysics-Multiscale Computational Modeling Framework using Piezoelectric Composites", Poster, *Data-Driven and Computational Modeling Across Scales,* California Nano Systems Institute, UCLA, May 10-12, 2023.

21. S. Dan, P. Tarafder and **S. Ghosh**, "A Machine Learning-Aided Digital Twin for Damage Sensing based on a Multiphysics-Multiscale Computational Modeling Framework using Piezoelectric Composites", *Engineering Mechanics Institute Conference 2023 (EMI 2023) ASCE*, Georgia Institute of Technology, GA, June 6-9, 2023.

22. T. Maloth and **S. Ghosh**, "Coupled Crystal Plasticity Phase-Field Model for Ductile Fracture in Polycrystalline Microstructures", *15th International Conference on Fracture,* Atlanta, GA, June 11-16, 2023.

23. K. A. Nair and **S. Ghosh**, "Crack Tip Enhanced Crystal Plasticity Phase Field Model For Crack Propagation In Ti64 Alloys", *15th International Conference on Fracture,* Atlanta, GA, June 11-16, 2023.

24. **S. Ghosh**, M. Pinz, B. Murgas, "Efficient Computational Framework for Image-based Micromechanical Analysis of Additively Manufactured Ti-6Al-4V Alloy", *TMS 2023 Annual Meeting & Exhibition*, March 19–23, 2023, San Diego, California.

25. **S. Ghosh**, G. Weber, M. Pinz, "Data-Driven Bayesian Model-Based Prediction of Fatigue Crack Nucleation in Ni-based Superalloys", *TMS 2023 Annual Meeting & Exhibition*, March 19–23, 2023, San Diego, California.

26. **S. Ghosh**, G. Weber, M. Pinz, "Data-Driven Bayesian Model for Predicting Fatigue Crack Nucleation in Polycrystalline Ni-based Superalloys", *AIAA SciTech Forum*, Gaylord National Resort & Convention Center, MD, Jan 23 – 27, 2023.

27. C. Prakash and **S. Ghosh**, "A Concurrent Model Framework for Self-consistent Homogenization based Parametrically Upscaled Continuum Damage Mechanics (PUCDM) Model for High Strain-Rate Response of Composites", *10th International Conference on Multiscale Materials Modeling (MMM10)*, Baltimore MD, October 3, 2022.

28. Xiaofan Zhang and **S. Ghosh**, "Data-driven Parametrically-Upscaled Continuum Damage Mechanics (PUCDM) Model for Composites", *10th International Conference on Multiscale Materials Modeling (MMM10)*, Baltimore MD, October 3, 2022.

29. Yanrong Xiao and **S. Ghosh**, "Uncertainty-Quantified Parametrically-Upscaled Continuum Damage Mechanics (UQ-PUCDM) Model for Unidirectional Composites with Nonuniform Microstructural Distributions", *10th International Conference on Multiscale Materials Modeling (MMM10)*, Baltimore MD, October 3, 2022.

30. S. Dan and **S. Ghosh**, "Adaptive Wavelet-Enhanced Cohesive Zone Phase-Field FE Model for Crack Evolution in Piezoelectric Composites", *10th International Conference on Multiscale Materials Modeling (MMM10)*, Baltimore MD, October 3, 2022.

31. P. Tarafder and **S. Ghosh**, "Parametrically Upscaled Coupled Constitutive Model (PUCCM) for Nonuniform Unidirectional Multifunctional Composites From Micromechanical Analysis", *10th International Conference on Multiscale Materials Modeling (MMM10)*, Baltimore MD, October 3, 2022.

32. B. Murgas, J. Stickel and **S. Ghosh**, "Multi-Scale Modeling Platform for Performance and Failure Analysis of Cold Spray Formed Aluminum Alloys", *10th International Conference on Multiscale Materials Modeling (MMM10)*, Baltimore MD, October 3, 2022.

33. T. Maloth and **S. Ghosh**, "Wavelet-Enriched Adaptive Coupled Crystal Plasticity Phase-Field FE Model for Ductile Fracture in Polycrystalline Microstructures", *10th International Conference on Multiscale Materials Modeling (MMM10)*, Baltimore MD, October 3, 2022.

34. Xiaofan Zhang and **S. Ghosh**, "Data-driven and Machine Learning Methods for Parametrically-Upscaled Damage Models for Woven Composites", *Meshfree and Finite Element Methods with Applications*, Berkeley CA, September 25-27, 2022.

35. **S. Ghosh**, S. Dan and P. Tarafder, "Integrated Multi-Physics, Multi-scale Computational Modeling Framework for Multifunctional Applications", *CIMTEC 2022 - 15th International Conference on Modern Materials and Technologies*, Perugia, Italy, June 20-29, 2022.

36. **S. Ghosh**, "Multiscale Deformation and Failure Modeling of Materials with Heterogeneities", *HEMI/Sandia Workshop on Materials under Extreme Conditions*, Johns Hopkins University, September 1, 2022.

37. S. Dan, P. Tarafder and **S. Ghosh,** "Adaptive Wavelet-Enhanced Cohesive Zone Phase-Field FE Model for Crack Evolution in Piezoelectric Composites", *Engineering Mechanics Institute Conference,* Johns Hopkins University, Baltimore, MD, June 1-3, 2022.

38. T. Maloth and **S. Ghosh,** "Coupled Crystal Plasticity Phase-Field Model for Ductile Fracture in Polycrystalline Microstructures", *Engineering Mechanics Institute Conference,* Johns Hopkins University, Baltimore, MD, June 1-3, 2022.

39. X. Zhang and **S. Ghosh,** "Data-Driven Parametrically-Upscaled Continuum Damage Mechanics (PUCDM) Model for Composites", *Engineering Mechanics Institute Conference,* Johns Hopkins University, Baltimore, MD, June 1-3, 2022.

40. Y. Xiao and **S. Ghosh,** "Uncertainty-Quantified Parametrically-Upscaled Continuum Damage Mechanics (UQ-PUCDM) Model for Plain Weave Woven Composites", *Engineering Mechanics Institute Conference,* Johns Hopkins University, Baltimore, MD, June 1-3, 2022.

41. A. Sinha Roy, N. Mitra and **S. Ghosh,** "Tensile Deformation in Polyurea: An All Atom Molecular Dynamics Study", *Engineering Mechanics Institute Conference,* Johns Hopkins University, Baltimore, MD, June 1-3, 2022.

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2. L. Ma, P. Karve, H. James; S. Mahadevan, S. Mohadeseh Taheri-Mousavi, S. Storck, M. Trexler, **S. Ghosh**, A. Rollett, B. Croom, "Process Sensitivity of Laser Powder Bed Fusion of IN718 to Composition Variation", *MS&T 2024 Materials Science & Technology,* Pittsburgh, PA, October 6-9, 2024.

3. J. Stickel, B. Murgas, L. Brewer and **S. Ghosh**, "Statistically Equivalent Virtual Microstructures for Modeling of Complex Polycrystalline Alloys Using a Generative Adversarial Network (GAN)-Enabled Computational Platform", *MS&T 2024 Materials Science & Technology,* Pittsburgh, PA, October 6-9, 2024.

4. S.K. Gargeya and **S. Ghosh**, A Porous Crystal Plasticity Finite Element Model for Void Evolution in Aluminum Alloys under Multiaxial Loading, TMS 2023 Annual Meeting & Exhibition, March 3-7, 2024, Orlando, Florida.

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62. D. Deka, D. Joseph and **S. Ghosh,** "Towards the evaluation of dwell fatigue in Ti 6242 alloys using crystal plasticity", *8th US National Congress on Computational Mechanics*, Austin, TX, July 2005.

63. M. Groeber, B. Haley, D. Dimiduk, M. Uchic, and **S. Ghosh,** "Microstructure characterization using 3-D EBSD data collected by an automated FIB-EBSD system", *ASM*, Columbus, OH, October 2004.

64. **S. Ghosh,** "A computational program for multiscale analysis of failure in nonuniform composites", *AFOSR Mechanics of Materials & Devices Grantees Meeting*, Santa Fe, NM, September 2003.

65. **S. Ghosh,** "A crystal plasticity modeling of polycrystalline Ti-6Al and Ti-6242 materials", *AFOSR MEANS Workshop*, Boulder, CO, August 2003.

66. **S. Ghosh**, "Multiple scale computational model for composite materials with microstructural damage", *Multiple Scale Analyses and Coupled Physical Systems, St-Venant Symposium*, Marne-la-Vallee, France, August 1997.

67. S. Moorthy and S**. Ghosh**, "Damage modeling in heterogeneous materials by the Voronoi cell finite element method", *14th Army Symposium on Solid Mechanics*, Myrtle Beach, SC, October 1996.

68. S. Roy, S. **Ghosh** and R. Shivpuri, "FEM- micro Genetic algorithm based approach to optimal design of multistage metal forming processes", *NUMIFORM 95*, Cornell University, Ithaca, NY, June 1995.

69. **S. Ghosh**, K.H. Lee and S. Moorthy, "Multiple scale modeling of heterogeneous materials using the Voronoi cell finite element method", 3rd *World Congress on Computational Mechanics WCCM III*, Makuhari, Japan, August 1994.

70. **S. Ghosh**, S. Moorthy and K.H. Lee, "Multiple scale Voronoi cell finite element model for arbitrary heterogeneous materials," *12th U.S. National Congress of Applied Mechanics*, University of Washington, Seattle, WA, June 1994.

71. **S. Ghosh** and S. Moorthy, "A Voronoi cell finite element method for elastic-plastic analysis of arbitrary heterogeneous materials", *12th U.S. National Congress of Applied Mechanics*, University of Washington, Seattle, WA, June 1994.

72. R. Duggirala, R. Shivpuri, S. Kini, **S. Ghosh** and S. Roy, "Computer aided approach for design and optimization of cold forging sequence for automotive parts", *International Cold and Warm Forging Technology Conference*, Columbus, OH, September 1994.

73. R. Shivpuri, D. Damodaran**, S. Ghosh** and S. Roy, "Computer aided approaches to improved quality in the extrusion of shapes and drawing of tubes", *Tenth Annual World Tube Congress*, Rockford, IL, October 1994.

74. **S. Ghosh**, "Finite element analysis of heterogeneous media using Dirichlet tessellation methods", 1992 *ASME Applied Mechanics, Materials and Aerospace Summer Meeting*, Scottsdale, AZ, April 1992.

75. **S. Ghosh**, "Adaptive arbitrary Lagrangian-Eulerian finite element method in metal forming", *MECAMAT '91, LARGE PLASTIC DEFORMATIONS*, Fontainebleau, France, August, 1991.

76. **S. Ghosh**, "Finite deformation analysis involving contact of deformable bodies using the finite element method with arbitrary Lagrangian-Eulerian description", *ASME Winter Annual Meeting*, Dallas, TX, November 1990.

77. **S. Ghosh**, "An adaptive arbitrary Lagrangian-Eulerian finite element description for large deformation analysis of elastic-viscoplastic solids", *11th National Congress of Applied Mechanics*, The University of Arizona, AZ, May 1990.

78. N. Kikuchi and S**. Ghosh**, "Arbitrary Lagrangian-Eulerian finite element description for forming simulations of elastic-viscoplastic solids", *26th Annual Meeting of Society of Engineering Science*, The University of Michigan, Ann Arbor, MI, September 1989.

79. **S. Ghosh**, "An arbitrary Lagrangian-Eulerian description for finite element analysis of large deformation of elasto-viscoplastic solids with contact", 3rd *Joint ASCE/ASME Mechanics Conference*, University of California at San Diego, La Jolla, CA, July 1989.

80. **S. Ghosh**, "A new finite element description for simulation of metal forming processes", *3rd International Conference on Numerical Methods in Industrial Forming Processes*, Colorado State University, Fort Collins, CO, June 1989.

81. **S. Ghosh** and N. Kikuchi, "An implicit arbitrary Lagrangian-Eulerian finite element analysis of elastic-viscoplastic large deformation problems in solid mechanics", *Applied Mechanics and Engineering Sciences Conference*, The University of California, Berkeley, CA, June 1988.

82. **S. Ghosh**, "Impact of symbolic manipulation in integrated modeling and analysis with engineering workstations", *Grantees Conference, NASA AMES Research Center*, Moffett Field, CA, October 1987.

83. N. Ghosh, H. Rajiyah, S**. Ghosh**, and S. Mukherjee, "A new boundary element formulation for linear elasticity", 10th *U.S. National Congress of Applied Mechanics*, The University of Texas, Austin, TX, June 1986.

84. **S. Ghosh** and N. Kikuchi, "Finite element simulation of hot sheet metal forming processes", *10th U.S. National Congress of Applied Mechanics*, The University of Texas, Austin, TX, June 1986.

85. **S. Ghosh** and S. Mukherjee, "Boundary element analysis of thermoelastic deformation in non-homogeneous media", *18th Midwestern Mechanics Conference*, University of Iowa, Iowa City, IA, May 1983.

❑ INVITED SEMINARS

1. **S. Ghosh,** "Machine Learning Enabled Parametrically Upscaled Constitutive Models (PUCM): A Data Driven Multiscale Modeling Approach for Metals & Composites", *Computational Mechanics at ORNL*, Oak Ridge National Laboratory, June 2024

2. **S. Ghosh,** "Parametrically Upscaled Constitutive Models (PUCM): A Data Driven Multiscale Modeling Approach for Metals & Composites", Department of *Mechanical Engineering, Rutgers University*, April 2024

3. **S. Ghosh,** "Parametrically Upscaled Constitutive Models (PUCM) for Multiscale Prediction of Fatigue Crack Nucleation in Ti Alloys", Department of *Materials Science, Carnegie Mellon University*, September 2022

4. **S. Ghosh,** "Parametrically Upscaled Constitutive Models for Fatigue and Damage Modeling of Metals and Composites", *Engineering Science Department, University of Oxford*, November 2021

5. **S. Ghosh,** "Current and Future Approaches for Fatigue Modeling", *Raytheon Technologies X, Physics-Based Materials and Process Modeling Community of Practice Meeting*, September 2021

6. **S. Ghosh,** "Physics Embedded Machine Learning Methods in Hierarchical Constitutive and Damage Modeling of Metals and Composites", *Machine Learning Seminars, Crunch Group, Brown University*, June 11, 2021.

7. **S. Ghosh,** "Multi-Scale Computational Models for Predicting Fatigue Crack Nucleation in Metallic Materials", *Department of Mechanical and Aerospace Engineering, North Carolina State University* March 1, 2019.

8. **S. Ghosh,** "Multi-Scale Computational Models for Predicting Fatigue Crack Nucleation in Metallic Materials", *Department of Mechanical Engineering & Mechanics, Drexel University, Philadelphia, PA,* May 18, 2018.

9. **S. Ghosh,** "Multi-Scale Computational Models for Predicting Fatigue Crack Nucleation in Metallic Materials", *Department of Mechanical Science & Engineering, University of Illinois, Urbana Champaign, IL,* April 2, 2018.

10. **S. Ghosh,** "Spatial and Temporal Multiscale Models for Advancing the Integrated Computational Structure-Materials Engineering Initiative", *School of Aeronautics and Astronautics, Purdue University, West Lafayette, IN,* March 30, 2017.

11. **S. Ghosh,** "Issues in Computational Mechanics for Advancing ICME Related Initiatives for Metals and Alloys", *Department of Materials Science, University of Michigan, Ann Arbor, MI,* March 24, 2017.

12. **S. Ghosh,** "Spatial and Temporal Multiscale Models for Advancing the Integrated Computational Structure-Materials Engineering Initiative", *Materials Science and Engineering Sciences Seminar Series, Sandia National Laboratories*, March 16, 2017.

13. **S. Ghosh,** "Spatial and Temporal Multiscale Models for Advancing the Integrated Computational Structure-Materials Engineering Initiative", *Department of Civil Engineering & Engineering Mechanics, Columbia University*, February 14, 2017.

14. **S. Ghosh,** "Computational Mechanics Approaches for Addressing the Integrated Computational Materials Engineering Initiative", *Department of Mechanical and Aerospace Engineering, University of Buffalo*, October 27, 2016.

15. **S. Ghosh**, "Spatial and Temporal Multi-Scale Modeling of Lightweight Materials: Addressing the ICMSE Initiative", *National Institute of Standards and Technology*, Gaithersburg, MD, April 24, 2015.

16. **S. Ghosh**, "Research Activities in JHU Computational Mechanics Research Laboratory", *Lockheed Martin Webinar*, August 15, 2014.

17. **S. Ghosh**, "Image Based Crystal Plasticity FE Models for Predicting Fatigue in Polycrystalline Alloys: Addressing the ICMSE Initiative", Department of Mechanical Engineering, *Texas A&M University*, College Station, Texas, March 5, 2014.

18. **S. Ghosh,** "Image -Based CPFE Models for Fatigue Crack Initiation in Polycrystalline Ti Alloys", *Pratt & Whitney Webinar*, November 1, 2013.

19. **S. Ghosh,** "Computational Mechanics Applications in Integrated Computational Materials Science & Engineering (ICMSE)", *Structures Division, NAVAIR*, Pax River, October 9, 2013.

20. **S. Ghosh,** "Computational Mechanics Applications in Integrated Computational Materials Science & Engineering (ICMSE)", *NASA Langley Research Center*, August 26, 2013.

21. **S. Ghosh,** "Computational Mechanics Applications in Integrated Computational Materials Science & Engineering (ICMSE)", *General Motors Technical Center*, Warren, MI, March 2013.

22. **S. Ghosh,** "Computational Mechanics Applications in Integrated Computational Materials Science & Engineering (ICMSE)", *Department of Civil and Environmental Engineering, Vanderbilt University*, February 2013.

23. **S. Ghosh, "**Computational Models for Multi-Scale Modeling of Deformation and Failure in Polycrystalline and Poly-phase Materials", Department of Mechanical Engineering, *Johns Hopkins University*, September 2012.

24. **S. Ghosh,** "Research in Computational Mechanics Research Laboratory (CMRL): A Virtual Way to Reality", Department of Civil Engineering, *Johns Hopkins University*, September 2012.

25. **S. Ghosh,** "Crystal Plasticity FE Models for Fatigue Crack Initiation in Polycrystalline Metals Using Temporal Multi-Scaling", Departments of Mechanical and Civil Engineering, *California Institute of Technology*, March 2012.

26. **S. Ghosh,** "Multi-Time Scaling Image Based Crystal Plasticity FE Models Dwell Fatigue Initiation in Polycrystalline Ti Alloys", Department of Civil Engineering, *Carnegie Mellon University*, November 2011.

27. **S. Ghosh**, "Multi-Scale Modeling of Deformation and Failure in Poly-phase and Polycrystalline Materials", *Army Research Laboratory*, Aberdeen, MD, June 2011.

28. **S. Ghosh,** "Multi-Scale Approach for Constitutive Modeling of γ–γ' Nickel Based Superalloys", Metals Branch, *US Air Force Research Laboratory* Wright Patterson Air Force Base, January 2011.

29. **S. Ghosh,** "Multi-Scale Modeling of Deformation and Failure in Poly-phase and Polycrystalline Materials", GE J.F. Welch Technical Center, Bangalore, India, December 2010.

30. **S. Ghosh,** "Dwell Fatigue Initiation in Polycrystalline Ti Alloys Using Multi-Time Scaling, Department of Aerospace Engineering, Texas A&M University, April, 2010.

31. **S. Ghosh,** "Overview of Research Activities at the Computational Mechanics Research Laboratory at OSU", Department of Civil Engineering, Johns Hopkins University, March, 2010.

32. **S. Ghosh,** "Overview of Research Activities at the Computational Mechanics Research Laboratory at OSU", Department of Mechanical Engineering, Pennsylvania State University, March, 2010.

33. **S. Ghosh,** "Dwell Fatigue Initiation in Polycrystalline Ti Alloys Using Multi-Time Scaling, T-3 Los Alamos National Laboratory, Los Alamos, New Mexico, February 4, 2010.

34. **S. Ghosh**, **"**Dwell Fatigue Initiation in Polycrystalline Ti Alloys Using Multi-Time Scaling Crystal Plasticity FE Models", Department of Mechanical Science & Engineering, Duke University, Durham NC, December 2009.

35. **S. Ghosh**, **"**Dwell Fatigue Initiation in Polycrystalline Ti Alloys Using Multi-Time Scaling Crystal Plasticity FE Models", Department of Mechanical Science & Engineering, University of Illinois, Urbana Champaign, November 2009.

36. **S. Ghosh**, **"**Multi- Scale Modeling of Failure and Fatigue in Composite and Poly-crystalline Materials", *Department of Aerospace Engineering*, The Ohio State University, October 2009.

37. **S. Ghosh**, **"**Activities at the Computational Mechanics Research at OSU,'' *Procter and Gamble*, Cincinnati, February 2009.

38. **S. Ghosh**, **"**A Multi-scale Characterization and Analysis for Ductile Fracture in Heterogeneous Metallic

Materials,'' *University of Colorado*, Boulder, February 2009.

39. **S. Ghosh**, **"**A Multi-scale Characterization and Analysis for Ductile Fracture in Heterogeneous Metallic Materials,'' *University of Cincinnati*, Cincinnati, January 2009.

40. **S. Ghosh**, **"**A Multi-scale Characterization and Analysis for Ductile Fracture in Heterogeneous Metallic Materials,'' *University of Florida*, Gainesville, March 2008.

41. **S. Ghosh**, **"**A Multi-scale Characterization and Analysis for Ductile Fracture in Heterogeneous Metallic Materials,'' *University of Southern California*, January 2008.

42. **S. Ghosh**, **"**A Multi-scale Characterization Based Domain Partitioning Method for Heterogeneous Metallic Materials,'' *Materials Directorate, Air Force Research Laboratories*, Wright Patterson Air Force Base, January 2008.

43. **S. Ghosh**, **"**Deformation and Fatigue Modeling of Polycrystalline Metals,'' *Rolls Royce Corporation*, Indianapolis, January 2008.

44. **S. Ghosh**, **"**Multi-scale Modeling of Failure in Composites and Metallic Materials: Challenges and Progress,'' *MSC Software Distinguished Speaker Seminar Series* - # 8 (Webinar), December 2007.

45. **S. Ghosh**, **"**Predicting Ductile Fracture in Structures: A Multi-Scale Approach,'' *Michigan Technological University*, Houghton, MI, October 2007.

46. **S. Ghosh**, **"**Crystal Plasticity Models with Multi-Time Scaling for Cyclic Deformation of Polycrystalline Metals,'' *Stanford University*, Palo Alto, CA, May 2007.

47. **S. Ghosh**, **"**Crystal Plasticity Models with Multi-Time Scaling for Cyclic Deformation of Polycrystalline Metals,'' *University of California*, Berkeley, CA, May 2007.

48. **S. Ghosh**, **"**Multiple Scale Modeling of Deformation and Damage in Composite and Polycrystalline Materials,'' *Purdue University*, West Lafayette, IN, January 2007.

49. **S. Ghosh**, **"**Computational multi-scale models for structure-material interaction,'' Georgia Institute of Technology, Atlanta, GA, March, 2006.

50. **S. Ghosh**, **"**Computational multi-scale models for structure-material interaction,'' *University of Akron*, Akron, OH, March, 2006.

51. **S. Ghosh**, **"**Computational multi-scale models for structure-material interaction,'' *Lawrence Livermore National Laboratory*, Livermore, California, February, 2006.

52. **S. Ghosh,** H. Chao, A. J. Bai, D.M. Valiveti, "Ductility modeling in cast Aluminum alloys'', Ford Scientific Research Laboratory, Dearborn, MI, February 2006.

53. **S. Ghosh**, **"**Computational multi-scale models for structure-material interaction,'' *Rensselaer Polytechnic Institute*, Troy, New York, February, 2006.

54. **S. Ghosh,** H. Chao, A. Tiwary, D.M. Valiveti, "Ductility modeling in cast Aluminum alloys'', Ford Scientific Research Laboratory, Dearborn, MI, May 2005.

55. **S. Ghosh "**Multiple scale modeling for deformation and failure of heterogeneous materials'', *Indian*

Institute of Technology, Delhi, India, December 2004.

56. **S. Ghosh "**Multiple scale modeling of composite and polycrystalline materials'', *Indian Institute of Technology*, Mumbai, India, December 2004.

57. **S. Ghosh "**Multiple scale modeling of composite and polycrystalline materials'', *Bhabha Atomic Research Center*, Trombay, India, December 2004.

58. **S. Ghosh** "Modeling cyclic deformation in HSLA steels with direct interfaces to fatigue Modeling'', *Daimler Chrysler Corporation*, Durability Tech Club Meeting, November 2004.

59. **S. Ghosh "**Multiple scale modeling for deformation and failure of heterogeneous materials'', *Johns University*, MD, September 2004

60. **S. Ghosh,** H. Chao, A. Tiwary, D.M. Valiveti, " Ductility modeling in cast Aluminum alloys'', Ford Scientific Research Laboratory, Dearborn, MI, September 2004.

61. **S. Ghosh "**Multiple scale modeling of composite and polycrystalline materials'', Department of Engineering Mechanics, Beijing University, China, September 2004.

62. **S. Ghosh "**Multiple scale modeling of composite and polycrystalline materials'', Army Research Laboratory, Aberdeen, MD, May 2004.

63. **S. Ghosh** "Multi-scale modeling of heterogeneous materials ''*, University of Nebraska*, November 2003.

64. **S. Ghosh,** ` Multilevel models for multiple scale analysis of composite materials', *Annual Symposium in the Computational Science & Engineering Program*, The University of Illinois, Urbana-Champaign, April 2003

65. **S. Ghosh,** ` Multi-scale model for damage and failure of heterogeneous materials ''*, High Performance Computing Division*, Army Research Laboratory, Aberdeen, MD, April 2003.

66. **S. Ghosh,** "An adaptive multi-level computational models for heterogeneous materials'', *Department of Mechanical Engineering, Florida State University*, Tallahassee, FL March 2002.

67. **S. Ghosh,** "An adaptive multi-level computational models for heterogeneous materials'', *Department of Civil Engineering and Theoretical & Applied Mechanics, The University of Illinois*, Urbana-Champaign, IL April 2002.

68. **S. Ghosh,** "Integrated experimental-computational program for development of fatigue based reliability models in automotive applications'', *Daimler Chrysler Corporation*, Auburn Hills, MI, November 2002.

69. **S. Ghosh,** "A multiscale approach to bone analysis and design of total hip prosthesis,*" Center for Materials Research, The Ohio State University*, May, 2002.

70. **S. Ghosh,** "Adaptive multi-level computational models for material modeling'', *Department of Materials Science & Engineering, The Ohio State University*, March 2001.

71. **S. Ghosh,** "Multi-scale modeling of heterogeneous materials''*, Los Alamos National Laboratory, New Mexico*, December 2000.

72. **S. Ghosh,** "Characterization and multi-scale modeling of composite materials'', *Department of Materials Science. Polytechnic University of Madrid*, September 2000.

73. **S. Ghosh,** "Characterization and multi-scale modeling of composite materials'', *CDGA, The University of Bordeaux I*, France, September 2000.

74. **S. Ghosh,** "Multiple scale modeling of damage in composite materials'', Goodyear *Technical Center*, Akron, OH, November 1998.

75. **S. Ghosh,** "Multiple Scale Modeling of Heterogeneous Materials: Jargon or Reality?*" Department of Aerospace Engineering, Applied Mechanics & Aviation, The Ohio State University,* October 1998.

76. **S. Ghosh,** "Computational Modeling of Heterogeneous Materials; Material Characterization, Meso-scale and Multiple-Scale Modeling," *CDGA, The University of Bordeaux I*, France, September 1997.

77. **S. Ghosh,** "Computational mechanics in hierarchical modeling of heterogeneous materials,*" Center for Materials Research, The Ohio State University*, May, 1997.

78. **S. Ghosh,** "Multiple scale analysis of heterogeneous materials with microstructural Voronoi cell finite element method and asymptotic homogenization," *Center for Materials Research, The Ohio State University*, February 1996.

79. **S. Ghosh,** "Multiple scale analysis of porous and composite materials with microstructural Voronoi cell finite element method," *Naval Research Laboratory*, Washington D.C., December 1995.

80. **S. Ghosh,** "Multiple scale analysis of porous and composite materials with microstructural Voronoi cell finite element method," *Wright Patterson Air Force Base*, Dayton, OH, September 1995.

81. **S. Ghosh,** "Multiple scale analysis of heterogeneous materials with microstructural Voronoi Cell Finite Element Method," *Dept. of Aerospace Engineering, Texas A&M University*, College Station, TX, April 1995.

82. **S. Ghosh,** "Multiple scale analysis of heterogeneous structures using the Voronoi cell finite element method," *Army Research Laboratory,* Aberdeen Proving Ground, MD, June 1994.

83. **S. Ghosh,** "Multiple scale analysis of heterogeneous structures using the Voronoi cell finite element method,*" Ford Scientific Research Laboratory,* Dearborn, MI, May 1994.

84. **S. Ghosh,** "Multiple scale analysis of heterogeneous materials using the Voronoi cell finite element method," *ALCOA Technical Center*, Pittsburgh, PA, March 1994.

85. **S. Ghosh,** "A material based finite element analysis of heterogeneous media involving Dirichlet tessellations,*" ALCOA Technical Center,* PA, July, 1992.

86. **S. Ghosh,** "Adaptive arbitrary Lagrangian-Eulerian finite element method in metal forming simulation,*" CRAY Research INC.,* March 1992.

87. **S. Ghosh,** "A new finite element approach to analysis of random composites using tessellation methods," *ALCOA Technical Center*, PA, September 1991.

88. **S. Ghosh,** "Arbitrary Lagrangian-Eulerian finite element method in metal forming simulation," *Indian Institute of Technology,* India, June 1991.

89. **S. Ghosh,** "An arbitrary Lagrangian-Eulerian finite element analysis for simulation of metal forming problems,*" Research Seminar in Physics and Astronomy,* The University of Alabama, April 1990.

90. **S. Ghosh,** "An arbitrary Lagrangian-Eulerian finite element analysis for simulation of metal forming problems," *Metallurgical Engineering Research Seminar*, The University of Alabama, October 1989.

91. **S. Ghosh,** "Arbitrary Lagrangian-Eulerian finite element description for forming simulations of elastic-viscoplastic solids," *Research Seminar, ALCOA Technical Center*, PA, January 1989.

❑ TEACHING

♦ **At Johns Hopkins University**

EN 560/530.730	Graduate	Finite Element Methods
EN 560/530.772	Graduate	Nonlinear Finite Element Methods
EN 560/530.770	Graduate	Advanced Finite Element and Multi-scale Methods

♦ **At the Ohio State University**

ME 400	Undergraduate	Statics and Strength of Materials
ME 420	Undergraduate	Strength of Materials
ME 639	Undergraduate/Graduate	Applied Finite Element Method
ME 842	Graduate	Computational Mechanics for Nonlinear Deformation
ME 838	Graduate	Advanced Topics in Finite Element Methods
ME/CE 768	Graduate	Introduction to Finite Element Methods
ME/CE 839	Graduate	Finite Element Methods in Engineering Science

♦ **At the University of Alabama**

MH 264	Undergraduate	Dynamics
MH 540	Graduate	Continuum Mechanics
MH 545	Graduate	Finite Element Analysis
MH 640	Graduate	Advanced Topics in Continuum Mechanics
MH 645	Graduate	Advanced FEM in Engineering Mechanics
GES 554	Graduate	Partial Differential Equations
GES 551	Graduate	Vectors and Matrices

♦ **New Course Development**

At Johns Hopkins University

EN 560/739	Graduate	Nonlinear Finite Element Methods
EN 560.770	Graduate	Advanced Finite Element and Multi-scale Methods

At the Ohio State University

ME 639	Undergraduate/Graduate	Applied Finite Element Method
ME 842	Graduate	Computational Mechanics for Nonlinear Deformation
ME 838	Graduate	Advanced Topics in Finite Element Methods

At the University of Alabama

MH 640	Graduate	Advanced Topics in Continuum Mechanics
MH 645	Graduate	Advanced FEM in Engineering Mechanics

♦ **Laboratory Supervision**

(i) ***At the Ohio State University***
ME 639 Computational Laboratory Developed a laboratory curriculum for Applied FEM class
(ii) ***At the University of Alabama***
Workstation Network in Mechanics and Metallurgical Engineering Systems Administrator

☐ PROFESSIONAL ACTIVITIES

♦ ***Professional Leadership***

2023- ***Co-Director/Co-PI of NASA Space Technology Research Institute (STRI)*** on Integrated Computational Modeling and Simulation Platform for Q&C of Additive Manufacturing

2018-2022 ***Publications Committee Chair & JOM Advisor***, ICME Committee, (**TMS**)

2018-2020 ***Vice-President, Board of Governors***, Engineering Mechanics Institute, (**EMI/ASCE**)
Treasurer (2017-2018), ***Member of BoG*** (2016-2020) (**EMI/ASCE**)

2014-2016 ***President,*** US Association for Computational Mechanics (**USACM**),
Vice-President (2012-2014), ***Secretary/Treasurer*** (2010-2012). ***Past-President*** (2016-2020)
Member, Executive Council (2008-2012, 2002-2006)

2014-2016 Established Technical Thrust Areas (TTA) as President (**USACM**)

2013- ***Founder/Director***, JHU Center for Integrated Structure-Materials Modeling & Simulation (**CISMMS**)

2016-2018 ***Founder/Director***, JHU Software Hub (**JHU-SofHub**)

2012-2018 ***Director & PI***, Air Force Center of Excellence on Integrated Materials Modeling (**CEIMM**)

2015- ***Governing Board Member,*** Gordon Research Conference on *Multifunctional Materials & Structures: The Science of Autonomic, Adaptive and Self-Sustaining Systems*

2011-2013 ***Chair,*** Computational Mechanics Comm., Engineering Mechanics Institute, (**ASCE/EMI**)
Vice-Chair (2010-2011), ***Past-Chair*** (2013-2017)

2009-2024 ***Member of General Council,*** Inter. Association of Computational Mechanics (**IACM**)

2007-2011 ***Chair,*** Committee of Computing in Applied Mechanics (CONCAM), (***Vice-Chair:*** 2005-2007) (**ASME/AMD**)

2007-2009 ***Chair,*** Committee of Materials Processing and Manufacturing (MPM), (***Vice-Chair:*** 2005-2007) (**ASME/AMD**)

2020- Awards Committee member of various ASME, USACM, IACM, ASCE/EMI and TMS awards

♦ ***Journal Editorial Board***

2024- *Associate Editor*, Journal of Materials Informatics, OAE Publishing Inc.
2015- *Associate Editor*, International Journal for Multi-scale Computational Engineering, Begell House Inc.
2022- *Advisory Board*, Meccanica, Springer
2021- *Editorial Board*, Computer Methods in Applied Mechanics and Engineering, Elsevier.
2020- *Editorial Board*, International Journal of Fatigue, Elsevier.
2012- *Editorial Board*, Advanced Modeling and Simulation in Engineering Science, Springer.
2012- *Editorial Review Board*, Integrating Materials and Manufacturing Innovation (IMMI), Springer.
2010- *Editorial Advisory Board*, International Journal of Plasticity, Elsevier.
2009- *Editorial Board*, Computational Mechanics, Springer.
2008- *Editorial Board*, Modeling and Simulation in Materials Science & Engineering (MSMSE), IOP
2007- *Editorial Board*, International Journal of Multiscale Modelling & Computation, World Scientific
2007- *Editorial Board*, Interactive and Multiscale Mechanics: An International Journal, Techno-Press
2003- *Editorial Advisory Board*, Int. Journal for Multi-scale Computational Engineering, Begell House
2004- *Editorial Board*, Int. Jour. Computational Meth. Engineering Science & Mechanics, Taylor & Francis
2004-2010 *Associate Editor*, ASME Journal of Engineering Materials and Technology
2001-2004 *Board of Editors*, Computer Modeling in Engineering and Sciences, Tech Science Press

♦ ***Professional Society/Committee Membership***

2015-2019 ***Member***, Materials Innovation Committee, (**TMS**)

2014-present ***Member***, Computational Materials Science and Engineering Committee, (**TMS**)
2014-present ***Member***, Integrated Computational Materials Engineering Committee, (**TMS**)
2017-present ***Member***, Titanium Committee, (**TMS**)
2010- present ***Member,*** American Society for Civil Engineers (**ASCE**)
2007- present ***Member,*** American Association for the Advancement of Science (**AAAS**)
2006- present ***Member,*** The Minerals, Metals and Materials Society (**TMS**)
2006-2010 ***Member,*** American Society for Composites (**ASC**)
2005-2009 ***Member,*** Executive Committee**, (ASME/AMD**)
2000- present ***Member,*** ASM International, The Material Information Society (**ASM**)
1988- present ***Member***, American Society of Mechanical Engineers (**ASME**)
1990- present ***Member***, United States Association of Computational Mechanics (**USACM**)
1990- present ***Member***, International Association of Computational Mechanics (**IACM**)
2000- present ***Member***, American Academy of Mechanics (**AAM**)
2000- present ***Member***, Committee on Computational Mechanics, (**CM/ASCE**)

♦ ***Program Review Boards/Panels***

2023 ***Member of External Review Panel***, Structural Materials, Naval Research Laboratory
2023 ***Member of Scientific Advisory Board***, Center for Extreme Events in Structurally Evolving Materials, University of Wisconsin
2019-2022 ***Member of Advisory Council***, LAETA- Associated Laboratory for Energy, Transports and Aeronautics, a R&D network with engineering in Portugal
2016- ***External Evaluation Team****, Dept. of Materials Design & Innovation, University of Buffalo, NY*
2016- ***Member of External Advisory Team****, Comprehensive Digital Transformation (CDT), NASA Langley Research Center (LeRC)*
2016 ***Member****, Corporate Strategic Research's 2016 CTC Reassessment Panel, ExxonMobil Corp.*

♦ ***Conference and Workshop Organizer/Chair***

1. ***Shaping the Future of Multifunctional Materials and Structures: A Symposium in Honor of Dr. 'Les' Lee,",*** Johns Hopkins University, Baltimore, MD, September 19-20, 2024**,** Conference co-Chair and co-Organizer.

2. ***2022 Engineering Mechanics Institute Conference*** (EMI 2022), Baltimore, MD, May 31-June 3, 2022, Conference co-Chair and co-Organizer.

3. ***10th International Conference on Multiscale Materials Modeling*** (MMM 2022), Baltimore, MD, October 2-7, 2022, Conference co-Chair and co-Organizer.

4. ***1st Annual CISMMS Workshop***, Johns Hopkins University, Baltimore, MD, December 12, 2018, Organizer.

5. ***USACM Thematic Conference on Uncertainty Quantification in Computational Solid and Structural Materials Modeling***, Baltimore, MD, January 2019, Co-Organizer.

6. ***Symposium on Uncertainty Quantification in Materials Science,*** Sandia National Laboratory, Sandia, NM, December 2017, Co-Organizer.

7. **IUTAM Symposium** SYFSO12 on ***Integrated Computational Structure-Material Modeling of Deformation and Failure under Extreme Conditions***, Royal Sonesta Harbor Court Hotel, Baltimore, MD, June 2016. Chair and Organizer.

8. **ARO** sponsored workshop on ***Challenges in Integrated Computational Structure-Material Modeling of High Strain-Rate Deformation and Failure in Heterogeneous Materials***, Johns Hopkins University, Baltimore, MD, September 2013, Workshop Chair and Organizer.

9. ***22nd International Workshop on Computational Mechanics of Materials*** (IWCMM-XXII), Baltimore, MD, September 2012, Workshop Chair and Organizer.

10. **AFOSR** sponsored workshop on ***Multiscale, Multiphysics Analysis & Design for Multifunctional Applications (MMADMA)***, Westin Hotel, Arlington, VA, May 2011, Workshop Chair and Organizer.

11. **NSF** sponsored workshop on ***Challenges in Computational Multiscale Materials Modeling (CCMMM)***, Westin Hotel, Arlington, VA, May 2011, Workshop Chair and Organizer.

12. ***10th US National Congress of Computational Mechanics***, Columbus, Ohio, July 2009, Conference Chair and Organizer.

13. ***Microstructure Simulation and Mesh Generation for FE Analysis***, Ohio State University, December 6-7, 2007, Workshop Organizer (with A.D. Rollett and A. Geltmacher).

14. ***NUMIFORM 2004: Numerical Methods in Industrial Forming Processes***, The Ohio State University, June 2004, Conference Chair and Organizer.

15. **ARO Workshop on *Analysis and Design of New Engineered Materials and Systems with Applications,*** The Ohio State University, February 5-6, 2002, Workshop Organizer.

16. ***The Integration of Material, Process and Product Design***, Seven Springs, Mountain Resort, PA, October 19-20, 1998, Conference Co-Organizer (with N. Zabaras, L. Lalli, R. Becker).

♦ ***Mini-Symposia Organizer at Conferences***

1. ***Multiscale Materials Modelling from Atoms to Macroscale***, *11th European Solid Mechanics Conference (ESMC2022), Galway, Ireland, 2022*, (with Siegfried Schmauder, William Curtin and Vera Petrova).

2. ***Multiscale Methods for Simulation and Design of Materials Including Machine Learning and Other Emerging Methods***, *IMECE 2019: ASME , Salt Lake City, UT, 2019*, (with A. Masud).

3. ***Hierarchical and Multiscale Methods for Simulation Based Design of Materials***, *EMI 2019: Engineering Mechanics Institute Conference, Pasadena, CA, June 18-21, 2019*, (with A. Masud).

4. ***Multiscale Structure-Materials Modeling: Addressing the State of the Art and Identified Gaps***, World Congress on Computational Mechanics (WCCM), New York, NY, July 22-27, 2018, (with K. Matous).

5. ***Hierarchical and Multiscale Methods for Simulation Based Design of Materials***, *EMI 2018: Engineering Mechanics Institute Conference, Cambridge, MA, May 29-31, 2018*, (with A. Masud).

6. ***Hierarchical and Multiscale Methods for Simulation Based Design of Materials***, *EMI 2017: Engineering Mechanics Institute Conference, San Diego, CA, June 4-7, 2017*, (with A. Masud).

7. ***Fundamental Methods for Integrating Microstructure-Property-Design Relationships into the ICME Paradigm — Microstructure Characterization and Representation***, *TMS 2015 144th Annual Meeting & Exhibition, Orlando, FL, March 15-19, 2015*, (with C. Woodward).

8. ***High-Performance Aerospace Alloys Design Using ICME Approach*** *TMS 2015 144th Annual Meeting & Exhibition, Orlando, FL, March 15-19, 2015*, (with A, Pandey and D. Li).

9. ***Integrated Computational Materials Engineering -ICME***, *11th. World Congress on Computational Mechanics (WCCM2014)*, July 2014, (with G. Laschet, J. Llorca, E. A. Holm and M. Chiumenti).

10. ***Homogenization and Coarse-Graining Methods for Heterogeneous Solids***, *US National Congress on Theoretical and Applied Mechanics (USNCTAM)*, June 2014, (with D. M. Kochmann).

11. ***Microstructural Effects in Plasticity***, *Plasticity '10*, St. Kitts Island, January 2010, (with Elizabeth Holm)

12. ***Modeling Issues and Computational Methodologies of Virtual Polycrystals***, *10th US National Congress of Computational Mechanics*, Columbus, Ohio, July 2009, (with P. R. Dawson and P. Young)

13. ***Nonlocal Methods and Length Scale Effects,*** *ASME International Mechanical Engineering Congress and Exposition*, Boston, Ma, November 2008, (with F. Bobaru).

14. ***Processing and Engineering Applications of Novel Materials,*** *ASME International Mechanical Engineering Congress and Exposition*, Seattle, Wa, November 2007, (Track Co-Chair: with E. Sancaktar, D. Siginer, J. Liburdy, R. Koganti).

15. ***Spatial and/or Temporal Multi-scale Modeling of Materials,*** *9th US National Congress of Computational Mechanics*, San Francisco, CA, July 2007.

16. ***Multi-Scale Simulations and Experiments in Materials Processes,*** *ASME International Mechanical Engineering Congress and Exposition*, Chicago, IL, November 2006, (co-organizer: M. Li, A. Maniatty).

17. ***Advances and Applications of Multiscale Modeling and Analysis Methods,*** *7th World Congress of Computational Mechanics: WCCM*, Los Angeles, CA, July 2006, (co-organizer: K. Terada).

18. ***Modeling Microscale Material Behavior with Experimental Integration,*** *7th World Congress of Computational Mechanics: WCCM*, Los Angeles, CA, July 2006, (co-organizer: P. Dawson).

19. ***Advances in Computing the Dynamic Behavior of Heterogeneous Materials, 7th*** *World Congress of Computational Mechanics: WCCM*, Los Angeles, CA, July 2006, (co-organizer: F. Bobaru).

20. ***Multi-Scale Problems and Related Computational Methods,*** *International Workshops on Advances in Computational Mechanics: IWACOM*, Hosei University, Tokyo, Japan, November 2004, (co-organizer: K. Terada, T. Yamada).

21. ***Multi-Scale Computational Methods for Composite Materials And Structures,*** *6th World Congress of Computational Mechanics*, WCCM VI, Beijing, China, September 2004, (co-organizer: K. Terada).

22. ***Multi-scale Material Modeling,*** *7th US National Congress of Computational Mechanics*, Albuquerque, NM, July 2003.

23. ***Material Modeling at Various Length Scales***, *International Conference on Computational Engineering and Sciences*, Reno, Nevada, July-August 2002.

24. ***Second Symposium on Computational Modeling of Multiscale Phenomena: Multiscale 2002***, Petropolis, Brazil, August 2002. (co-organizer: G. Paulino)

25. ***Arthur Leissa 70th Birthday Symposium***, *US National Congress of Theoretical and Applied Mechanics*, Virginia Tech and State University, June, 2002. (co-organizer S.E. Bechtel and A. Noor),

26. ***Computational Materials Modeling***, *International Conference on Computational Engineering and Sciences*, Puerto Vallarta, Mexico August 2001.

27. ***Computational Methods in Advanced Materials Modeling and Micromechanics***, *International Conference on Computational Engineering & Sciences*, Atlanta, GA, October 1998.

28. ***Bridging the Length Scales***, *4th U.S. National Congress of Computational Mechanics*, San Francisco, CA, August 1997. (co-organizer: J. Fish).

29. ***Integrated Experimental-Computational Modeling of Advanced Materials***, *McNU'97*, Summer Annual Meeting of ASME in 1997. (co-organizer: R.E. Everett).

30. ***Computational Methods in Micromechanics***, *ASME International Mechanical Engineering Congress and Exposition*, November 1995. (co-organizer: M. Ostoja-Starzewskii).

31. ***Computational Methods in Micromechanics***, *3rd U.S. National Congress on Computational Mechanics*, Dallas, TX, June 1995.

32. ***Adaptive Finite Element Method in Industrial Forming Processes***, *First National Congress of Computational Mechanics*, Chicago, July 1991.

♦ ***Conference Scientific/Advisory Committees***

1. ***16th World Congress on Computational Mechanics and 4th Pan American Congress on Computational Mechanics (WCCM-PANACM 2024)***, Vancouver, Canada, July 22-25, 2024, International Scientific Committee.

2. ***EMI 2017 Engineering Mechanics Institute (EMI) Conference***, Vanderbilt University, Nashville, TN, May 22-25, 2016, International Scientific Committee.

3. ***EMI 2016 Conference & Probabilistic Mechanics & Reliability 2016 Conference***, San Diego, California, USA, June 4-7, 2017, International Scientific Committee.

4. ***Gordon Research Conference*** **on** ***Multifunctional Materials & Structures: The Science of Autonomic, Adaptive and Self-Sustaining Systems***, *Ventura, CA, January 31-February 5, 2016,* Advisory Committee.

5. ***PANACM 2015: 1st. Pan-American Congress on Computational Mechanics,*** Buenos Aires, Argentina, April 27-29, 2015, International Scientific Committee.

6. ***UNCECOMP 2015: 1st International Conference on Uncertainty Quantification in Computational Sciences and Engineering,*** 25 - 27 May 2015 Crete Island, Greece, International Scientific Committee.

7. ***5th International Congress on Computational Mechanics and Simulation (ICCMS 2014)***, CSIR-Structural Engineering Research Centre (CSIR-SERC), Chennai, India, December 10-13, 2014, International Scientific Advisory Committee.

8. ***24th International Workshop on Computational Mechanics of Materials (IWCMM 24)***, IMDEA Materials Institute, Getafe, Madrid, October 1-3, 2014, International Organizing Committee.

9. ***7th International Conference on Multiscale Materials Modeling (MMM2014)***, Berkeley, CA, October 6-10, 2014, International Advisory Committee.

10. ***2nd Mach Conference***, Annapolis, MD, April 9-11, 2014, Scientific Committee.

11. ***23rd International Workshop on Computational Mechanics of Materials (IWCMM 23)***, National University of Singapore, Singapore, October 2-5, 2013, International Organizing Committee.

12. ***2013 Engineering Mechanics Institute Conference of American Society of Civil Engineers (EMI 2013)***, Northwestern University, Evanston, IL, August 4-7, 2013, Scientific Committee.

13. ***12th U.S. National Congress on Computational Mechanics (USNCCM12),*** Raleigh, North Carolina**,** July 22-25, 2013**,** USACM Executive Council and Steering Committee.

14. ***11th International Conference on Numerical Methods in Industrial Forming Processes, NUMIFORM 2013,*** Institute of Metal Research, Shenyang, China**,** July 6-10, 2013**,** Steering Committee**.**

15. ***4th International Congress on Computational Mechanics and Simulation (ICCMS 2012),*** Indian Institute of Technology Hyderabad, India**,** December 10-12, 2012**,** International Scientific Committee**.**

16. ***6th International Conference on Multiscale Materials Modeling,*** Singapore, October 2012**,** International Advisory Board and Steering Committee**.**

17. ***5th International Conference on Multiscale Materials Modeling,*** Freiburg/Germany, October 2010**,** International Advisory Board**.**

18. ***9th US National Congress of Computational Mechanics***, San Francisco, CA, July 2007, Technical Committee member.

19. ***ICTACEM 2004: Third International Congress on Theoretical, Applied, Computational and Experimental Mechanics***, Indian Institute of Technology, Kharagpur, December 2004, Technical Committee Co-Chair.

20. ***International Congress on Computational Mechanics and Simulation,*** Indian Institute of Technology, Kanpur, December 2004, Member of International Advisory Committee.

21. ***Mesoscale Mechanics of Heterogeneous Materials***, University of Alborg, Denmark, August 2002, Member of the Scientific Committee.

22. ***ICES'02 International Conference on Computational Engineering & Sciences***, Reno, Nevada, July-August 2002, Member of the Scientific Program Committee.

23. ***USNCCM VI Sixth U.S. National Congress on Computational Mechanics***, Dearborn, Michigan, August 2001, Member of the Scientific Committee.

24. ***ICES'01 International Conference on Computational Engineering & Sciences***, Puerto Vallarta, Mexico, August 2001, Member of the Scientific Program Committee.

25. ***2nd International Conference on Theoretical, Computational and Experimental Mechanics***", Indian Institute of Technology, Kharagpur, December 2001, Member of the International Advisory Committee.

26. ***5th International Conference on the Technology of Plasticity***, Columbus OH, October 1996, Member of the Organizing Committee.

☐ UNIVERSITY SERVICE AND COMMITTEES

♦ *University Leadership*

2016-2017 ***Founder-Director,*** Johns Hopkins Software Hub (JHU-SofHub)
2013-present ***Founder-Director,*** JHU Center for Integrated Structure-Materials Modeling & Simulation (CISMMS)

♦ *College and University Committees*

(i) At Johns Hopkins University (Standing Committees)

2022 Member, Homewood Academic Council Nominating Committee
2021-present Member, Homewood Research Computing Committee (HRCC)
2021-2024 Member, Whiting School of Engineering Faculty Senate
2019-present Member, Board of Review, JHU Homewood Academic Council
2012-Present Hopkins Extreme Materials Institute (HEMI) Appointments Committee

JHU (Ad Hoc Committees)

2023 Chair, Ad Hoc P&T Committee, Mechanical Engineering
2019 Chair, Ad Hoc P&T Committee, Mechanical Engineering
2016 Chair, Ad Hoc P&T Committee, Earth & Planetary Sciences
2014-2015 Ad Hoc P&T Committee, ME
2014-2015 Whiting School of Engineering vice Dean Search Committee
2012-2013 Hopkins Extreme Materials Institute (HEMI) Executive Committee
2012 MSE Ad Hoc Promotion Committee
2012 MSE Departmental Review Committee
2012-2013 WSE Strategic Plan Implementation Committee

(ii) At the Ohio State University

2009-2011 University Research Computing Committee
2009 College of Engineering, Dean's Leadership Committee
2008-2011 University Senate Committee on Honorary Degrees
2008-2011 President's AAAS Fellows Committee
2006 College of Engineering Faculty Search Committee

2006 Co-Lead in College's multi-million dollar successful proposal on "Materials Modeling" in response to Provost's Targeted Investment in Excellence (TIE).
2005 College of Engineering Strategic Planning Committee
2005 College of Engineering Strategic Planning Subcommittee in Advanced Materials
2005 College of Engineering Strategic Planning Subcommittee in Computing & Information
2005 College of Engineering Strategic Planning Subcommittee in Manufacturing
2003-2006 Faculty Advisory Committee Member, Center for Automotive Research
2001-2003 College of Engineering, Honors and Awards Committee
2001-2003 College of Engineering, Promotion and Tenure Committee
1991-1998 College of Engineering, Computer Planning Committee
1994-1996 College of Engineering, Honors Committee
1993 Chair, Region II PC subcommittee

(iii) At the University of Alabama
1988-1991 College of Engineering Computer Facilities and Software Committee
1990 College of Engineering Ad-hoc Committee for Tenure and Promotion

♦ ***Departmental Committees***

(i) At Johns Hopkins University
2011-present Lead, Mechanics of Materials Thrust Area, CaSE department
2012-2021 Member, Graduate Studies & Recruiting committee, CaSE department
2015-2018 Member, Undergraduate Studies committee, CE department
2014-2016 Member, Faculty Search committee, CE department
2012-2014 Member, External Affairs committee, CE department
2012-2014 Member, Computing and IT committee, CE department
2011-2012 Seminar Coordinator, CE department

(ii) At the Ohio State University
2010 Chair, Department P&T Committee, ME department
2009 Ad-hoc Curriculum committee for ME Semester Conversion
2009 Ad-hoc committee for ME Performance Planning
2008-2009 Department P&T Committee, ME department
2007- 2009 Graduate Studies Committee, ME department
2007-2009 Graduate Recruiting Committee, ME dept.
2007-2011 Awards Committee, ME dept.
2006 Chair, Faculty Search Committee for Multi-scale Materials
2006-2007 Academic Review Self Study Committee, ME dept.
2005 Strategic Planning Committee, ME dept.
2004-2005 Member, Ohio Eminent Scholar Search Committee, ME dept.
2003-2004 Chair, Computer Committee, ME dept.
2002-2003 Chair, Applied Mechanics Interest Group, ME dept.
2002-2003 Chair, Search Committee in Computational Mechanics, ME dept.
2002-2003 Member, Search Committee in Design & Manufacturing, ME dept.
2002-2003 Member, Search Committee in Chair in MSE department
2001-2002 Honors and Awards Committee, ME department
2001-2002 Member, Search Committee in Physical Metallurgy, MSE dept.
2000-2001 Fellowship Coordinator, Graduate Studies Committee, ME department
1999-2001 Graduate Studies Committee, ME department
1999-2000 Computer Planning Committee, ME department
1994-1999 Chair, Integration Committee, AAA department

1994-1999 Member, Applied Mechanics Graduate Studies Committee
1997-1998 Chair, Recruiting Committee, AAA department
1993-1998 Chair, Computer Planning Committee of Applied Mechanics
1993-1994 Undergraduate Curriculum Committee

(iii) At the University of Alabama
1989-1990 Departmental Graduate Student Recruiting Committee
1989-1991 Departmental Computer Resources Committee

☐ CAREER HIGHLIGHTS

Somnath Ghosh is Michael G. Callas endowed Chair Professor at Johns Hopkins University. Till 2011, he was the John B. Nordholt Professor at the Ohio State University. He is the founding director of the JHU Center for Integrated Structure-Materials Modeling and Simulation (CISMMS) and is the co-director of a multi-institutional NASA STRI "IMCQAM: Institute for Model-based Qualification and Certification of Additive Manufacturing". He was the PI and director of an Air Force Center of Excellence in Integrated Materials Modeling "CEIMM" from 2012-2018.

Professor Ghosh is an internationally recognized leader in Mechanics of Materials, whose pioneering multidisciplinary research, integrating multiscale-multiphysics Computational Mechanics, Computational Materials Science, ICME, Machine Learning, etc. has made game-changing advances toward prognosis, life prediction and damage sensing of various materials including metals, composites, multifunctional materials. He has provided highly innovative solutions to challenging problems that have been major hurdles to the engineering community. His group has developed powerful methods of generating 3D statistically equivalent representative volume elements (SERVEs) for polycrystalline-polyphase materials that has led to the worldwide acclaimed synthetic microstructure building software DREAM3D. He has created the Parametrically Upscaled Constitutive models (PUCMs), considered to be a game-changer in multiscale modeling, explicitly linking material microstructure with component response for predicting deformation and failure. This technology, augmented by the Wavelet Transformation-Induced Multi-time Scaling (WATMUS) method of accelerating cyclic fatigue and multi-physics simulations, is being used to analyze component-material performance and life, leading to location-specific material design. It has generated a high level of interest in the aerospace and propulsion industry, e.g., Pratt & Whitney, GE, Rolls Royce, Lockheed Martin, as well as multiple DoD agencies and NASA. These companies are integrating the PUCMs with their development platforms for new material design for enhanced performance and durability. Another innovation is the widely recognized Voronoi Cell FEM (VCFEM), which represented a major step in micromechanical and multiscale modeling of heterogeneous materials. Professor Ghosh has published a large number of major journals and proceedings papers, and book chapters with high citations. He has authored a book entitled "Micromechanical Analysis and Multi-Scale Modeling Using the Voronoi Cell Finite Element Method, co-edited two books, "Computational Methods for Microstructure-Property Relations" and "Integrated Computational Materials Engineering (ICME): Advancing Computational and Experimental Methods".

His contributions have been recognized through prestigious awards and fellowships from various professional societies. He is a fellow of TMS (2021), Soc. Eng. Sci. (2019), EMI/ASCE (2014), Int. Assoc. Comp. Mech. (2010), Amer. Acad. Mech. (2010), AAAS (2007), US Assoc. Comp. Mech. (2007), ASM Int. (2006), ASME (2000). His awards include the JN Reddy Medal (2024 MAMS), Distinguished Scientist/Engineer Award (2023 TMS/MPMD), Raymond Mindlin Medal (2022 ASCE/EMI), J. Tinsley Oden Medal (2021 USACM), Computational Mechanics Award (2020 IACM), Ted Belytschko Applied Mechanics Medal (2019 ASME/MD), ICCM Investigator Medal (2018 ICCM), Distinguished Scientist/Engineer Award (2017

TMS/SMD), Nathan M. Newmark Medal (2013 ASCE), Distinguished Scholar Award (2007 Ohio State University) and Harrison Award for Eng. Excellence. (2001 Ohio State University), NSF Young Investigator Award (1994).

Somnath Ghosh has assumed important leadership roles in professional societies across disciplines. He was the President of US Association for Computational Mechanics (2014-2016) (Vice-President 2012-2014, Secretary/Treasurer 2010-2012, Past President 2016-2020, and a 2--term member of its executive council. He was an elected member and served as the Vice-President (2018-2020) and Treasurer (2017-2018) of ASCE-Engineering Mechanics Institute Board of Governors (EMI-BoG).