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CURRICULUM VITAE

Contents

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EDUCATION

January 26, 2025

Ph.D in Civil Engineering
RICE UNIVERSITY, 1989

Master of Civil Engineering
RICE UNIVERSITY, 1985

B.E. in Civil Engineering
AMERICAN UNIVERSITY OF BEIRUT, 1984

PROFESSIONAL EXPERIENCE

. Tryon Chair in Stochastic Methods and Simulation, University of Southern California, 2023-
. Visiting faculty, Google LLC., 2022.
. Gordon S. Marshall Professor of Engineering Technology, University of Southern California, 2011-2023
. Professor, University of Southern California, 2005-present
. Professor, The Johns Hopkins University, 2002-2004
. Director, Institute for Uncertainty Analysis and Management, Johns Hopkins University, 1998-2004
. Associate Professor, The Johns Hopkins University, 1998-2002
. Assistant Professor, The Johns Hopkins University, 1995-1998
. Assistant Professor, State University of New York, 1992-1995
. Visiting Faculty, Google., 2022
. Visiting Professor, Tongji University, Shanghai, China, 2014-2017
. Visiting Professor, École Normale Supérieure de Cachan, France, 2002
. Visiting Professor, Université Marne la Vallée, France, 2003, 2004
. Visiting Faculty, Sandia National Laboratories, July-August 2002, 2003 and 2004
. Visiting Scientist, Kyoto University, 2000
. Post-Doctoral Research Associate, Rice University, 1988-1991
. Research Assistant, Rice University, 1985-1988

AWARDS AND HONORS

. Distinguished Member (ASCE), 2023
. Theodore von Karman Medal (ASCE), 2022
. Fellow of the Society for Industrial and Applied Mathematics (SIAM), 2019
. Fellow of the International Association for Computational Mechanics (IACM), 2018
. Fellow of the American Association for the Advancement of Science (AAAS), 2016
. Fellow of the Engineering Mechanics Institute of ASCE, 2013
. International Association for Structural Safety and Reliability (IASSAR) Senior Research Award, 2009
. Computational Structural Mechanics Award, U.S. Association for Computational Mechanics, 2009
. Fellow of the U.S. Association on Computational Mechanics (USACM), 2007
. ASCE Walter L. Huber Civil Engineering Research Prize, 2000
. Distinguished Faculty Award for Excellence in Undergraduate Education, Johns Hopkins, 1996
. IASSAR Junior Research Award, 1993

RESEARCH INTERESTS

Predictive science; Probabilistic modeling and stochastic systems; Data assimilation and propagation of uncertainty in complex systems; Probabilistic multi-scale modeling and analysis.

PUBLICATIONS

Books:

1. Ghanem, R., Higdon, D., and Owhadi, H., *Handbook of Uncertainty Quantification,* Springer-Verlag, 2017.

2. Ghanem, R., and Spanos, P., *Stochastic Finite Elements: A Spectral Approach*, Springer Verlag, 1991. (reissued by Dover Publications, 2003.)

Papers in Refereed Journals:

1. X. Zeng, G. Geraci, A. Gorodetsky, J. Jakeman, R. Ghanem, "Boosting efficiency and reducing graph reliance: Basis adaptation integration in Bayesian multi-fidelity networks," *Computer Methods in Applied Mechanics and Engineering* Vol. 436, 117657 (2025).

2. X. Zeng, R. Ghanem, "Data-driven projection pursuit adaptation of polynomial chaos expansions for dependent high-dimensional parameters," *Computer Methods in Applied Mechanics and Engineering,* Vol. 433, 11750 (2024).

3. Zhuang, B., Arcaro, A., Gencturk, B., and Ghanem, R., "Machine learning-aided damage identification of mock-up spent nuclear fuel assemblies in a sealed dry storage canister," *Engineering Applications of Artificial Intelligence,* Vol. 128, pp. 107484 (2024).

4. A Arcaro, B Zhuang, B Gencturk, R Ghanem, "Damage detection and localization in sealed spent nuclear fuel dry storage canisters using multi-task machine learning classifiers," *Reliability Engineering & System Safety*, **52**, 110446, (2024).

5. C Soize, R Ghanem, "Transient anisotropic kernel for probabilistic learning on manifolds," *Computer Methods in Applied Mechanics and Engineering*, Vol. 432, 117453, (2024).

6. Z Gou, X Tu, SV Lototsky, R Ghanem , "Switching diffusions for multiscale uncertainty quantification," *International Journal of Non-Linear Mechanics,* 104793, (2024).

7. A Bonazzi, X Zeng, R Ghanem, B Jha, FPJ de Barros, "Probabilistic assessment of scalar transport under hydrodynamically unstable flows in heterogeneous porous media," *Advances in Water Resources* Vol. 188, 104706, (2024).

8. P Hawi, R Ghanem, "Mesh refinement as probabilistic learning," *Journal of Machine Learning for Modeling and Computing,* Vol. 5, Number 4, (2024).

9. C Soize, R Ghanem, "Probabilistic-learning-based stochastic surrogate model from small incomplete datasets for nonlinear dynamical systems," *Computer Methods in Applied Mechanics and Engineering,* Vol. 418, 116498, (2024).

10. Z Wang, R Ghanem, "Stochastic modeling and statistical calibration with model error and scarce data," *Computer Methods in Applied Mechanics and Engineering* Vol. 416, 116339 (2023).

11. X Zeng, G Geraci, MS Eldred, JD Jakeman, AA Gorodetsky, R Ghanem, "Multifidelity uncertainty quantification with models based on dissimilar parameters," *Computer Methods in Applied Mechanics and Engineering,* 415, 116205, (2023)

12. Wang, Z., Hawi, P., Masri, S., Aitharaju, V. and Ghanem, R., "Stochastic multiscale modeling for quantifying statistical and model errors with application to composite materials," *Reliability Engineering & System Safety,* Vol. 235, (2023).

13. Wang, Z. and Ghanem, R., "A Stochastic framework for optimal control of planetary re-entry trajectories under multi-level uncertainties," *AIAA Journal*, (doi: https://doi.org/10.2514/1.J062515)

14. Ezvan, O. Soize, C., Desceliers, C. and Ghanem, R., "Updating an uncertain and expensive computational model in structural dynamics based on one single target FRF using a probabilistic learning tool," *Computational Mechanics,* pp.1-17, 2023.

15. Aghagholizadeh, M., Gencturk, B., Ghanem, R., Arcaro, A., "Damage detection of spent nuclear fuel canisters using frequency response functions," *Annals of Nuclear Energy,* Vol. 185, 2023.

16. Zeng, X. and Ghanem, R., "Projection pursuit adaptation on polynomial chaos expansions," *Computer Methods in Applied Mechanics and Engineernig,* Vol. 405, 2023.

17. Zhang, R. and Ghanem, R., "Drivers Learn City-Scale Intra-Daily Dynamic Equilibrium," *IEEE Transactions on Intelligent Transportation Systems,* doi.org/10.1109/TITS.2021.3140163, (2022).

18. Safta, C., Ghanem, R., Grant, M., Sparapany, M., and Najm, H., "Trajectory design via unsupervised probabilistic learning on optimal manifolds," *Data-Centric Engineering ,* Vol. 3 , 2022, e26, doi:10.1017/dce.2022.26, (2022)

19. Wang, Z. and Ghanem, R., "A functional global sensitivity measure and efficient reliability sensitivity analysis with respect to statistical parameters," *Computer Methods in Applied Mechanics and Engineering,* doi.org/10.1016/j.cma.2022.115175, 115175 (2022).

20. Zeng, X., Red-Horse, J., and Ghanem, R., "Accelerated basis adaptation in homogeneous chaos spaces," *Computer Methods in Applied Mechanics and Engineering,* doi:10.1016/j.cma.2021.114109, 114109 (2021).

21. Wang, Z. and Ghanem, R., "An extended polynomial chaos expansion for PDF characterization and variation with aleatory and epistemic uncertainties," *Computer Methods in Applied Mechanics and Engineering,* doi:10.1016/j.cma.2021.113854, 382, 113854 (2021).

22. Soize, C. and Ghanem, R., "Probabilistic Learning on Manifolds (PLoM) with partition," *International Journal for Numerical Methods in Engineering,* (2021) (DOI: 10.1002/nme.6856).

23. Zhang, R. and Ghanem, R., "Normal-bundle bootstrap," *SIAM Journal on Mathematics of Data Science (SIMODS)* Vol. 3, No. 2, pp. 573–592, 2021.

24. Soize, C. and Ghanem, R., "Probabilistic learning on manifolds constrained by nonlinear partial differential equations for small datasets," *Computer Methods in Applied Mechanics and Engineering,* doi:10.1016/j.cma.2021.113777, 380, 113777 (2021).

25. Ezvan, O., Zeng, X., Ghanem, R. and Gencturk, B., "Dominant substructural vibration modes for fully-loaded spent nuclear fuel canisters" *Computational Mechanics,* Vol. 67, pp: 365-384, 2021.

26. Ezvan, O., Zeng, X., Ghanem, R. and Gencturk, B., "Multiscale modal analysis of fully-loaded spent nuclear fuel canisters," *Computer Methods in Applied Mechanics and Engineering,* Vol. 367, 2020 (DOI:10.1016/j.cma.2020.113072).

27. Zeng, X. and Ghanem, R. "Dynamics identification and forecasting of COVID-19 by switching Kalman filters," *Computational Mechanics* Vol. 66, No, 5, pp. 1179-1193, 2020.

28. Soize, C. and Ghanem, R., "Probabilistic learning on manifolds," *AIMS: Foundations of Data Science,* Vol. 2(3): 279-307, 2020.

29. Ghanem R., Soize, C., Mehrez, L., Aitharaju, V., "Probabilistic learning and updating of a digital twin for composite material systems," *International Journal of Numerical Methods in Engineering,* 2020 (DOI: 10.1002/nme.6430).

30. Marmarelis, M. and Ghanem, R. "Data-driven stochastic optimization on manifolds for additive manufacturing," *Computational Materials Science*, Vol. 181, 109750, 2020.

31. Liang, X., Wang, R., and Ghanem, R., "Uncertainty Quantification of Detonation through Adapted Polynomial Chaos," *International Journal for Uncertainty Quantification*, Vol. 10, No. 1, 2020.

32. Zhang, R. and Ghanem, R. "Demand, supply, and performance of street-hail taxi," *IEEE Transactions on Intelligent Transportation Systems,* Vol. 21, No. 10, pp. 4123-4132, 2020.

33. C. Soize, R. Ghanem and C. Descelliers, "Sampling of Bayesian posteriors with a non-Gaussian probabilistic learning on manifolds from a small dataset", *Journal Statistics and Computing*, Vol. 30, No. 5, pp. 1433-1457, 2020.

34. Soize, C. and Ghanem, R., "Physics-constrained non-Gaussian learning on manifolds," *International Journal of Numerical Methods in Engineering,* Vol. 121, No. 1, pp. 110-145 2020.

35. Ghanem, R., Soize, C., Safta, C., Huan, X., Lacaze, G., Oefelin, J. and Najm, H.,"Design optimization of a scramjet under uncertainty using probabilistic learning on manifolds," *Journal of Computational Physics,* Vol. 399, 2019.

36. Soize, C., Ghanem, R., Safta, C., Huan, X., Vane, Z., Oefelin, J., Lacaze, G., Najm, N. "Enhancing Model Predictability for a Scramjet Using Probabilistic Learning on Manifolds," *AIAA Journal,* Vol. 57, No. 1, pp. 365-378, 2019.

37. Ghauch, Z., Aitharaju, V., Rodgers, W., Papusuleti, P., Dereims, A., and Ghanem, R., "Integrated stochastic analysis of fiber composites manufacturing using adapted polynomial chaos expansions," *Composites Part A: Applied Science and Manufacturing,* Vol. 118, pp. 179-193, 2019.

38. Soize, C., Ghanem, R., Safta, C., Huan, X., Vane, Z., Oefelin, J., Lacaze, G., Najm, H., Tang, Q., and Chen, X., "Entropy-based closure for probabilistic learning on manifolds," *Journal of Computational Physics,* Vol. 388, pp. 518-533, 2019.

39. Tsilifis, P., Huan, X., Safta, C., Sargsyan, K., Lacaze, G., Oefelin, J. Najm, H., and Ghanem, R., "Compressive sensing adaptation for polynomial chaos expansions," *Journal of Computational Physics,* Vol. 380, No. 1, pp. 29-47, 2019.

40. Ezvan, O., Zeng, X., Ghanem, R., and Gencturk, B., "Dominant vibration modes for broadband frequency analysis of multiscale structures with numerous local vibration modes," *International Journal for Numerical Methods in Engineering,* Vol. 117, No. 6., pp 644-692, 2019.

41. Tsilifis, P. and Ghanem, R., "Bayesian adaptation of chaos representations using variational inference and sampling on geodesics", *Proceedings of the Royal Society, A: Mathematical, Physical and Engineering Sciences*, Vol. 474, No. 2217, 2018.

42. Khalil, I., Pratt, Q., Schmachtenberger, H., and Ghanem, R., "Heat Transfer Modeling of Spent Nuclear Fuel Using Uncertainty Quantification and Polynomial Chaos Expansion," *Journal of Heat Transfer, Transactions of the ASME,* Vol. 140, No. 2. 2018.

43. Thimmisetty, C., Aminzadeh, F., Rose, K., and Ghanem, R., "Multiscale Stochastic Representations using Polynomial Chaos Expansions with Gaussian Process Coefficients", *Data-Enabled Discovery and Applications,* Vol. 2, No.3, 2018.

44. Ghanem, R., Soize, C., and Thimmisetty, C., "Optimal well-placement using probabilistic learning," *Data-Enabled Discovery and Applications,* Vol. 2, No.4, 2018.

45. Tsilifis, P., Browning, W., Wood, T., Newton, P. and Ghanem, R., " The stochastic quasi-chemical model for bacterial growth: Variational Bayesian parameter update," *Journal of Nonlinear Science,* Vol. 28, pp. 371-393, 2018.

46. Mehrez, L., Fish, J., Aitharaju, V., Rodgers, Will and Ghanem, R., "A PCE-based multiscale framework for the characterization of uncertainties in complex systems," *Computational Mechanics,* Vol. 61, No. 1-2, pp. 219-236, 2018.

47. Ghanem, R. and Soize, C., "Probabilistic Non-convex Constrained Optimization with Fixed Number of Function Evaluations," *International Journal for Numerical Methods in Engineering,* Vol. 113, pages 719-741, 2018 (DOI: 10.1002/nme.5632).

48. Thimmisetty, C., Ghanem, R., White, J., and Chen, X., "High-dimensional intrinsic interpolation using Gaussian process regression and diffusion maps," *Mathematical Geosciences,* Vol. 50, pp. 77-96, 2018.

49. Bassamzadeh, N. and Ghanem, R., "Probabilistic Data-Driven Prediction of Wellbore Signatures in High-Dimensional Data Using Bayesian Networks", *SPE Journal*, Vol. 23, No 4, pp. 1090-1104, 2018.

50. Thimmisetty, C., Tsilifis, P., and Ghanem, R., "Homogeneous chaos basis adaptation for design optimization under uncertainty: Application to the oil well placement problem," *Artificial Intelligence for Engineering Design, Analysis and Manufacturing,* Vol .31, No. 3, pp. 265-276, 2017.

51. Tsilifis, P. and Ghanem, R., "Reduced Wiener Chaos representation of random fields via basis adaptation and projection," *Journal of Computational Physics,* Vol. 341, pp. 102-120, 2017.

52. Bassamzadeh, N. and Ghanem, R., "Multiscale stochastic prediction of electricity demand in smart grids using Bayesian networks," *Applied Energy,* Vol. 193, pp. 369-380, 2017.

53. Soize, C. and Ghanem, R. "Polynomial chaos representations of databases on manifolds," *Journal of Computational Physics,* Vol. 335, pp, 201-221, 2017.

54. Tsilifis, P., Ghanem, R. and Hajali, P., "Efficient Bayesian experimentation using an expected information gain lower bound," *SIAM/ASA Journal of Uncertainty Qantification,* Vol. 5, pp. 30-62, 2017.

55. Xiao, H., Wang, J., and Ghanem, R. "A random matrix approach for quantifying model-form uncertainties in turbulence modeling," *Computer Methods in Applied Mechanics and Engineering,* Vol. 313, No. 1, pp. 941-965, 2017.

56. Soize, C. and Ghanem, R. "Data-driven probability concentration and sampling on manifold," *Journal of Computational Physics,* Vol. 321, pp. 242-258, 2016.

57. Meidani, H. and Ghanem, R., "Random Markov decision processes for sustainable infrastructure systems," *Structure and Infrastructure Engineering*, Vol. 11, No. 5, pp. 655-667, 2015.

58. Sargsyan, K, Najm, H. and Ghanem, R., "On the statistical calibration of physical models," *International Journal of Chemical Kinetics,* Vol. 47, No. 4, pp. 246-276, 2015.

59. Ghanem, R. and Soize, C., "Remarks on stochastic properties of materials through finite deformations," *International Journal for Multiscale Computational Engineering,* Vol. 13, No. 4, pp. 367-374, 2015.

60. Ghanem, R., Yadegaran, I., Thimmisetty, C., Keshavarzzadeh, V., Masri, S., Red-Horse, J., Moser, R., Oliver, T., Spanos, P., and Aldraihem, O., "A Probabilistic Approach to the NASA Langley Multidisciplinary Uncertainty Quantification Challenge Problem," *AIAA Journal of Aerospace Information Systems,* Vol. 12, pp. 170-188, 2015 .

61. Bassamzadeh, N., Ghanem, R., Lu, S. and Kazemitabar, J., "Robust scheduling of smart appliances with uncertain electricity prices in a heterogeneous population," *Energy and Buildings,* Vol. 84, pp. 537-547, 2014.

62. Comboul, M. and Ghanem, R., "Multiscale Modeling for Stochastic Forest Dynamics," *International Journal for Multiscale Computational Engineering,* Vol. 12, No. 4, pp. 319-329, 2014.

63. Lakeland, D., Rechenmacher, A. and Ghanem, R., "Towards a complete model of soil liquefaction: The importance of fluid flow and grain motion," *Proceedings of the Royal Society, A*, Vol. 470, No, 2165, 2014.

64. Meidani, H. and Ghanem, R., "Spectral power iterations for the random eigenvalue problem," *AIAA Journal,* Vol. 52, No. 5, pp. 912-925, 2014.

65. Sousedik, B. and Ghanem, R., "Truncated hierarchical preconditioning for the stochastic Galerkin FEM,"*International Journal on Uncertainty Quantification,* Vol. 4, No. 4, pp. 333-348, 2014.

66. Tipireddy, R. and Ghanem, R. "Adaptation in homogeneous chaos spaces," *Journal of Computational Physics,* Vol. 259, pp. 304-317, 2014.

67. V. Keshavarzzadeh, R. Ghanem , S. Masri and O. Aldraihem, "Convergence acceleration of polynomial chaos solutions via sequence transformation," *Computer Methods in Applied Mechanics and Engineering,* Vol. 271, No. 1, pp. 167-184, 2014.

68. Sousedik, B., Ghanem, R., and Phipps, E., "Hierarchical Schur complement preconditioner for the stochastic Galerkin finite element methods," *Numerical Linear Algebra with Applications,* Vol. 21, No. 1, pp. 136-151, 2014.

69. Arnst, M., Ghanem, R., Phipps, E., and Red-Horse, J., "Reduced chaos expansions with random coefficients in reduced-dimensional stochastic modeling of coupled problems," *International Journal for Numerical Methods in Engineering,* Vol. 97, No.5., pp. 352-376, 2014.

70. Comboul, M. and Ghanem, R., "The value of information in the design of resilient water distribution sensor networks," *ASCE's Journal of Water Resources Planning and Management,* Vol. 139, No. 4, pp. 449-455, 2013.

71. Arnst, M., Soize, C., and Ghanem, R., "Hybrid sampling/spectral method for solving stochastic coupled problems," *SIAM/ASA Journal on Uncertainty Quantification,* Vol. 1, No. 1, pp. 218-243, 2013.

72. Tipireddy, R., Ghanem, R., Ghosh, S. and Paquet, D., "High resolution micrograph synthesis using a parametric texture model and a particle filter," (doi:10.1186/2193-9772-2-2) *Integrating Materials and Manufacturing Innovation,* Vol. 2, No. 2, 2013.

73. Torrens, P., Kevrekidis, Y., Ghanem, R., andu Zou, Y., "Simple urban simulation atop complicated models: multi-scale Equation Free computing of sprawl using geographic automata," *Entropy,* Vol. 15, No. 7, pp. 2606-2634, 2013.

74. Meidani, H. and Ghanem, R., "Multiscale Markov models with random transitions for energy demand management," *Energy and Buildings,* Vol. 61, p. 267-274, 2013.

75. Noshadravan, A. and Ghanem, R., "A probabilistic mesoscale damage detection in polycrystals using a random matrix approach," *Journal of Intelligent Material Systems and Structures,* Vol. 24, No. 8, pp. 1007-1017, 2013.

76. Peng, Y.-B., Ghanem, R., and Li, J., "Generalized optimal control policy for stochastic optimal control of structures," *Structural Control and Health Monitoring,* Vol. 20, No. 2, pp. 67-89, 2013.

77. Noshadravan, A., Ghanem, R., Guilleminot, J., Atodaria, I., and Peralta, P., "Validation of a Probabilistic Model for Mesoscale Elasticity Tensor of Random Polycrystals," *International Journal for Uncertainty Quantification,* Vol. 3, No. 1, pp. 73-100, 2013.

78. Meidani, H. and Ghanem, R., "Uncertainty quantification for Markov chain models," *Chaos,* Vol. 22, No. 4, 2012.

79. Zou, Y. Kevrekidis, I., Torrens, P., and Ghanem, R., "Accelerating agent-based computation of complex urban systems," *International Journal of Geographical Information Science,* Vol. 26, No. 10, pp. 1917-1937, 2012.

80. Arnst, M., Ghanem, R., Phipps, E., and Red-Horse, J., "Measure transformation and efficient quadrature in reduced-dimensional stochastic modeling of coupled problems," *International Journal for Numerical Methods in Engineering,* Vol. 92, No. 12, pp. 1044-1080, 2012.

81. Arnst, M., Ghanem, R., Phipps, E., and Red-Horse, J., "Dimension reduction in stochastic modeling of coupled problems," *International Journal for Numerical Methods in Engineering,* Vol. 92, No. 11, pp. 940-968, 2012.

82. Guilleminot, J., Soize, C., and Ghanem, R., "Stochastic representation for anisotropic permeability tensor random fields," *International Journal for Numerical and Analytical Methods in Geomechanics,* Vol. 36, No. 13, pp. 1592-1608, 2012.

83. Ghosh, D., and Ghanem, R., "An invariant subspace-based approach to the random eigenvalue problem of systems with clustered spectrum," *International Journal for Numerical Methods in Engineering,* Vol. 91, No. 4, pp. 378-396, 2012.

84. Peng Y.B., Ghanem R., Li J., "Investigations of Microstructured Behaviors of Magnetorheological Suspensions," *Journal of Intelligent Material Systems and Structures,* Vol. 23, No. 12, pp. 1351-1370, 2012.

85. Arnst, M. and Ghanem, R., "A variational-inequality approach to stochastic boundary value problems with inequality constraints and its application to contact and elastoplasticity," *International Journal for Numerical Methods in Engineering,* Vol. 89, No. 13, pp. 1665-1690, 2012.

86. Bal, G., Ghanem, R., and Langmore, I., "Large deviation theory for a homogenized and 'corrected' elliptic ODE," *Journal of Differential Equations,* Vol. 251, No. 7, pp. 1864-1902, 2011.

87. Guilleminot, J., Noshadravan, A., Soize, C., and Ghanem, R., "A probabilistic model for bounded elasticity tensor random fields with application to polycrystalline microstructures," *Computer Methods in Applied Mechanics and Engineering,* Vol. 200, No. 17-20, pp. 1637-1648, 2011.

88. Arnst, M., Ghanem, R. and Masri, S., "Maximum entropy approach to the identification of stochastic reduced-order models of nonlinear dynamical systems," *The Aeronautical Journal,* Vol. 114, No. 1160, pp. 637-650, 2010.

89. Hernandez-Garcia M.R., Masri, S.F., Ghanem R., Figueiredo E., Farrar C.R., "A structural decomposition approach for detecting, locating, and quantifying nonlinearities in chain-like systems," *Structural Control & Health Monitoring,* Vol. 17, No. 7, pp. 761-777, 2010.

90. Peng Y.B., Ghanem R., Li J., "Polynomial chaos expansions for optimal control of nonlinear random oscillator," *Journal of Sound and Vibration,* Vol. 329, No. 18, pp. 3660-3678, 2010.

91. Hernandez-Garcia M.R., Masri, S.F., Ghanem R., Figueiredo E., Farrar C.R., "An experimental investigation of change detection in uncertain chain-like systems," *Journal of Sound and Vibration,* Vol. 329, No. 12, pp. 2395-2409, 2010.

92. Arnst M., Ghanem R., Soize C., "Identification of Bayesian posteriors for coefficients of chaos expansions," *Journal of Computational Physics,* Vol. 229, No,. 9, pp. 3134-3154, 2010.

93. Das, S., Spall, J., and Ghanem, R., "Efficient Monte Carlo computation of Fisher information matrix using prior information," *Computational Statistics and Data Analysis,* Vol. 54, pp. 272-289, 2010.

94. Masri S.F., Ghanem R., Arrate F., and Caffrey, J.P., "A data-based procedure for analyzing the response of uncertain nonlinear systems," *Structural Control & Health Monitoring,* Vol. 16, No. 7-8, pp. 724-750, 2009.

95. Ghanem, R., "Introduction to special section on uncertainty qantification in nanoscale modeling" *Journal of Computational and Theoretical Nanoscience,* Vol. 6, No. 10, pp. 2255-2255, 2009.

96. Arnst, M. and Ghanem, R., "Probabilistic electromechanical modeling of nanostructures with random geometry" *Journal of Computational and Theoretical Nanoscience,* Vol. 6, No. 10, pp. 2256-2272, 2009.

97. Das, S. and Ghanem, R. "A Bounded random matrix approach for stochastic upscaling," *SIAM Journal on Multiscale Modeling & Simulation,* Vol. 8, No. 1, pp. 296-325, 2009.

98. Das, S., Ghanem, R., and Finette, S., "Polynomial Chaos representation of spatio-temporal random fields from experimental measurements," *Journal of Computational Physics,* Vol. 228, No. 23, pp. 8726-8751, 2009.

99. Ghanem, R., "Uncertainty quantification in computational and prediction science," *International Journal for Numerical Methods in Engineering,* Vol. 80, No. 6-7, pp: 671-672, 2009.

100. Red-Horse, J., and Ghanem, R., "Elements of a functional analytic approach to probability," *International Journal for Numerical Methods in Engineering,* Vol. 80, No. 6-7, pp: 689-716, 2009.

101. Soize, C. and Ghanem, R. "Reduced Chaos decomposition with random coefficients of vector-valued random variables and random fields," *Computer Methods in Applied Mechanics and Engineering,* Vol. 198, No. 21-26, pp. 1926-1934, 2009.

102. Saad, G. and Ghanem, R., "Characterization of reservoir simulation models using a polynomial chaos-based ensemble Kalman filter ," *Water Resources Research,* Vol. 45, Art.Num. W04417, Apr 21 2009.

103. Ghanem, R. and Das, S., "Hybrid Representations of Coupled Nonparametric and Parametric Models for Dynamic Systems," ÂIAA Journal, Vol. 47, No. 4, pp. 1035-1044, 2009.

104. Sarkar, A. Benabbou, N. and Ghanem, R.,Domain Decomposition Of Stochastic PDEs: Theoretical Formulations" *International Journal for Numerical Methods in Engineering,* Vol. 77, No. 5, pp. 689-701, 2009.

105. Chen J., Ghanem R. and Li J., "Partition of the probability-assigned space in probability density evolution analysis of nonlinear stochastic structures," *Probabilistic Engineering Mechanics,* Vol. 24, No. 1, pp. 27-42, 2009.

106. Masri, S., Ghanem, R., Govindan, R., and Nayeri, R., "A decentralized procedure for structural health monitoring of uncertain nonlinear systems provided with dense active sensor arrays", *Smart Materials and Structures,* Vol. 17, No. 4, Article Number 045024, 2008.

107. To, A., Liu, W.-K., Olson, G., Belytschko, T., Chen, W., Shephard, M., Chung, Y.-W., Ghanem, R., Voorhees, P., Seidman, D., Wolverton, C., Chen, J.S., Moran, B., Freeman, A., Tian, R., Luo, X., Lautenschlager, E. and Challoner, D., "Materials integrity in microsystems: a framework for a petascale predictive-science-based multiscale modeling and simulation system," *Computational Mechanics,* Vol. 42, No. 4, pp. 485-510, 2008.

108. Das, S., Ghanem, R. and Spall, J., "Asymptotic Sampling Distribution for Polynomial Chaos Representation of Data : A Maximum-Entropy and Fisher information approach," *SIAM Journal on Scientific Computing,* Vol. 30, No. 5, pp. 2207-2234, 2008.

109. Nayeri R.D., Masri S.F., Ghanem R.G., Nigbor R.L., "A novel approach for the structural identification and monitoring of a full-scale 17-story building based on ambient vibration measurements," *Smart Materials & Structures,* Vol. 17, No. 2, Article Number 025006, 2008.

110. Arnst, M. and Ghanem, R., "Probabilistic equivalence and stochastic model reduction in multiscale analysis," *Computer Methods in Applied Mechanics and Engineering,* Vol. 197, No. 43-44, pp. 3584-3592, 2008.

111. Ghanem, R., Doostan, A. and Red-Horse, J., "A probabilistic construction of model validation," *Computer Methods in Applied Mechanics and Engineering,* Vol. 197, No. 29-32, pp. 2585-2595, 2008.

112. Ghosh, D. and Ghanem, R., "Stochastic convergence acceleration through basis enrichment of polynomial chaos expansions" *International Journal of Numerical methods in Engineering,* Vol. 73, No. 2, pp. 162-184, 2008.

113. Ghanem, R. and Ghosh, D., "An efficient characterization for the random eigenvalue problem in a polynomial chaos decomposition," *International Journal of Numerical methods in Engineering,* Vol. 72, pp. 486-504, 2007.

114. Doostan A, Ghanem RG, Red-Horse J "Stochastic model reduction for chaos representations," *Computer Methods in Applied Mechanics and Engineering,* Vol. 196 No. 37-40, pp. 3951-3966, 2007.

115. LeMaitre, O., Najm, H., Pebay, P., Ghanem, R. and Knio, O., "Multi-resolution-analysis scheme for uncertainty quantification in chemical systems," *SIAM Journal on Scientific Computing,* Vol. 29, No. 2, pp. 864-889, 2007.

116. Ghanem, R., Saad, G., and Doostan, A., "Efficient solution of stochastic systems: Application to the Enbankment dam problem," *Structural Safety,* Vol. 29, No.3, pp. 238-251, 2007.

117. Descelliers, C., Soize, C., and Ghanem, R., "Identification of chaos representations of elastic properties of random media using experimental vibration tests," *Computational Mechanics,* Vol. 39, No. 6, pp. 831-838, 2007.

118. Shi, J. and Ghanem, R. "A Stochastic nonlocal model for materials with multiscale behavior," *International Journal of Multiscale Computational Engineering,* Vol. 4, No. 4, pp. 501-519, 2006.

119. Boctor E., deOliveira M., Choti M., Ghanem, R., Taylor, R., Hager, G. and Fitchfinger, G. "Ultrasound monitoring of tissue ablation via deformation model and shape priors," *Lecture Notes in Computer Science,* Vol. 4191, pp. 405-412, 2006.

120. Masri, S., Ghanem, R., Arrate, F., and Caffrey, J., "Stochastic nonparametric models of uncertain hysteretic systems," *AIAA Journal*, Vol. 44, No. 10, pp. 2319-2330, 2006.

121. Zou, Y., Kevrekidis, and Ghanem, R., "Equation-free particle-based computations: Coarse projective integration and coarse dynamic renormalization in 2D," *Industrial and Engineering Chemistry Research,* Vol. 45 No. 21, pp. 7002-7014 2006.

122. Ghanem, R. and Doostan, A., "On the construction and analysis of stochastic predictive models: Characterization and propagation of the errors associated with limited data," *Journal of Computational Physics,* Vol. 217, No. 1, pp. 63-81, 2006.

123. Faverjon, B. and Ghanem, R. "Stochastic inversion in acoustic scattering," *JASA,* Vol. 119, No. 6, pp. 3577-3588, 2006.

124. Descelliers, C., Ghanem, R. and Soize, C. "Maximum likelihood estimation of stochastic chaos representation from experimental data," *International Journal for Numerical Methods in Engineering,* Vol. 66, No. 6, pp. 978-1001, 2006.

125. Sung Joon Moon, R. Ghanem, and I.G. Kevrekidis, "Coarse graining the dynamics of coupled oscillators," *Physical Review Letters,* Vol. 96, No. 14, Art. No. 144101, April 14, 2006.

126. Ghanem, R. and Ferro, G., "Health monitoring for strongly nonlinear systems using the Ensemble Kalman Filter," *Journal of Structural Control and Health Monitoring,* Vol. 13, pp. 245-259, 2006.

127. Zou, Y., Kevrekidis, Y. and Ghanem, R., "Equation-free dynamic renormalization: Self-similarity in multidimensional particle system dynamics," *Physical Review E*, Vol. E72, No. 4, Art No. 046702, Part 2, Oct 2005.

128. Descelliers, C., Ghanem, R. and Soize, C. "Polynomial chaos representation of a stochastic preconditioner," *International Journal for Numerical Methods in Engineering,* Vol. 64, No. 5, pp. 618-634, 2005.

129. Ghosh, D., Ghanem, R. and Red-Horse, J. "Analysis of eigenvalues and modal interaction of stochastic systems," *AIAA Journal,* Vol. 43, No. 10, pp. 2196-2201, 2005.

130. Zou, Y. and Ghanem, R. "Error Estimation for the spatial discretization of multiscale bridging models," *SIAM Journal of Multiscale Modeling,* Vol. 3, No. 4, pp. 940-956, 2005.

131. Reagan MT, Najm HN, Pebay PP, Knio, O. and Ghanem, R., "Quantifying uncertainty in chemical systems modeling," *International Journal of Chemical Kinetics,* Vol. 37, No. 6, pp. 368-382, 2005.

132. Xiu, D., Kevrekedis, I. and Ghanem, R., "An equation-free approach to uncertainty quantification in dynamical systems," *IAP/IEEE, Computing in Science and Engineering,* Vol. 7, No. 3, pp. 26-23, 2005.

133. Ghanem, R., Masri, S., Pellissetti, M., and Wolfe, R., "Identification and prediction of stochastic dynamical systems in a polynomial basis," *Computer Methods in Applied Mechanics and Engineering,* Vol. 194, No. 12-16, pp. 1641-1654, 2005.

134. Zou, Y. and Ghanem, R. "Multiscale data assimilation with the Ensemble Kalman Filter," *SIAM Journal of Multiscale Modeling,* Vol. 3, No. 1, pp. 131-150, 2004.

135. Le Maitre,O., Reagan, M.T., Debusschere, B., Najm, H.N., Ghanem, H.N. and Knio, O., "Natural convection in a closed cavity under stochastic, non-Boussinesq conditions," *SIAM Journal of Scientific Computing,* Vol. 26, No. 2, pp. 375-394, 2004.

136. Soize, C., and Ghanem, R. "Physical Systems with Random Uncertainties: Chaos representations with arbitrary probability measure," *SIAM Journal of Scientific Computing,* Vol. 26, No. 2, pp. 395-410, 2004.

137. Debusschere, B., Najm, H., Pebay, P., Knio, O., Ghanem, R., and Le Maitre, O., "Numerical challenges in the use of Polynomial Chaos representations for stochastic processes," *SIAM Journal of Scientific Computing,* Vol. 26, No. 2, pp. 698-719, 2004.

138. Ghanem, R. and Wojtkiewicz, S. "Editorial," *SIAM Journal of Scientific Computing,* Vol. 26, No. 2, pp. vii, 2004.

139. Manohar, C. and Ghanem, R., "Multivariate probability distribution of ordered peaks of vector Gaussian random processes," *Probabilistic Engineering Mechanics,* Vol. 20, No. 1, pp. 87-96, 2005.

140. Gattulli, V., and Ghanem, R., "Adaptive positioning control of guyed offshore towers through active mass dampers," *Arabian Journal of Science and Engineering,* Vol. 29, No. 1C, pp. 13-26, 2004.

141. Reagan, M.T., Najm, H., Debusschere, B., LeMaitre, O., Knio, O., and Ghanem, R., "Spectral stochastic uncertainty quantification in chemical systems," *Combustion Theory and Modelling,* Vol. 8, No. 3, p. 607-632, 2004.

142. Pellissetti, M. and Ghanem, R., "A method for the validation of predictive computations using a stochastic approach," *ASME Journal of Offshore Mechanics and Arctic Engineering,* Vol.126, No. 3, pp. 227-234, 2004.

143. Le Maitre, O.P., Najm, H., Ghanem, R. and Knio, O., "Multi-resolution analysis of Wiener-type uncertainty propagation schemes," *Journal of Computational Physics,* Vol 197, No. 2, pp 502-531, 2004.

144. Le Maitre, O.P., Knio. O., Najm, H., Ghanem, R., "Uncertainty propagation using Wiener-Haar expansions," *Journal of Computational Physics,* Vol. 197, pp. 28-57, 2004.

145. Matta, A., Knio, O.M., Ghanem, R.G., Chen, C.-H., Santiago, J.G., Debusschere, B., and Najm, H.N., "Computational study of band crossing reactions," *Journal of Microelectromechanical Systems,* Vol. 13, No. 2, pp. 310-322, 2004.

146. Jardak, M., and Ghanem, R. "Spectral stochastic homogenization for of divergence-type PDEs," *Computer Methods in Applied Mechanics and Engineering,* Vol. 193, No. 6-8, 429-447, 2004.

147. Romeo, F. and Ghanem, R. "Parametric identification of dynamical systems via wavelet-Galerkin approach," *Recent Research and Development in Sound and Vibration,* Vol. 2, pp. 1-28, 2004.

148. Honda, R. and Ghanem, R., "Spectral stochastic finite element method for log-normal uncertainty," *Journal of Applied Mechanics, JSCE* Vol. 7, pp. 391-398, Aug 2004.

149. Kanj, M., Abousleiman, Y., and Ghanem, R., "Poromechanics of Anisotropic Hollow-Cylinders," *ASCE Journal of Engineering Mechanics,* Vol. 129, No. 11, pp. 1277-1287, 2003.

150. Le Maitre, O.P., Knio. O., Debusschere, B.J., Najm, H.N., and Ghanem, R.G. "A multigrid solver for two-dimensional stochastic diffusion equations," *Computer Methods in Applied Mechanics and Engineering*, Vol. 192, pp. 4723-4744, 2003.

151. Debusschere, B., Najm, H., Matta, A., Knio, O., Ghanem, R., and Le Maitre, O., "Protein labeling reactions in electrochemical microchannel flow: Numerical simulation and uncertainty propagation," *Physics of Fluids,* Vol. 15, No. 8, pp. 2238-2250, 2003. (also appeared in the July 1, 2003 issue of the *Virtual Journal of Biological Physics Research*)

152. Reagan, M.T., Najm, H.N., Ghanem, R.G., and Knio, O.M., "Uncertainty quantification in reacting flow simulation through non-intrusive spectral projection," *Combustion and Flame,* Vol. 132 No. 3, pp. 545-555, 2003.

153. Sarkar, A. and Ghanem, R., "A substructure approach for the mid-frequency vibration of stochastic systems," *JASA,* Vol. 113, No. 4, pp. 1922-1934, 2003.

154. Ghanem, R. and Sarkar, A., "Reduced models for the medium-frequency dynamics of stochastic systems," *JASA,* Vol. 113, No. 2, pp. 834-846, 2003.

155. Ghanem, R. and Sarkar, A., "Mid-frequency structural dynamics with parameter uncertainty," *Computer Methods in Applied Mechanics and Engineering,* Vol. 191, pp. 5499-5513, 2002.

156. Le Maitre, O., Reagan, M., Najm, H., Ghanem, R., and Knio, O., "A stochastic projection method for fluid flow. II: Random Process," *Journal of Computational Physics,* Vol. 181, pp. 9-44, 2002.

157. Pettit, C., Jones, N., and Ghanem, R., "Detection and simulation of roof-corner pressure transients," *Journal of Wind Engineering and Industrial Aerodynamics,* Vol. 90, No. 3, pp. 171-200, 2002.

158. Ghanem, R., and Hayek, B., "Probabilistic modeling of flow over rough terrain," *ASME Journal of Fluids Engineering,* Vol. 124, No. 1, pp. 42-50, March, 2002.

159. Ghanem, R., and Pellissetti, M., "Adaptive data refinement in the spectral stochastic finite element method," *Communications in Numerical Methods in Engineering,* Vol. 18, No. 2, pp. 141-151, February 2002.

160. Sakamoto, S. and Ghanem, R., "Simulation of multi-dimensional non-gaussian non-stationary random fields," *Probabilistic Engineering Mechanics,* Vol. 17, No.2, pp. 167-176, April 2002.

161. Sakamoto, S., and Ghanem, R., "Polynomial chaos decomposition for the simulation of non-gaussian non-stationary stochastic processes," *ASCE Journal of Engineering Mechanics,* Vol. 128, No. 2, pp. 190-201, February 2002.

162. Ghiocel, D., and Ghanem, R. "Stochastic finite element analysis of seismic soil-structure interaction," *ASCE, Journal of Engineering Mechanics,* Vol 128, No.1, pp. 66-77, 2002.

163. Le Maitre, O., Knio, O., Najm, H., and Ghanem, R., "A stochastic projection method for fluid flow: Basic formulation," *Journal of Computational Physics,* Vol. 173, pp. 481-511, 2001.

164. Ghanem, R., and Shi, J., "Stochastic finite element analysis of stress concentration in random materials," *International Journal of Advanced Manufacturing Systems,* Vol. 4, No. 1, 2001, pp. 163-173.

165. Ghanem, R., and Romeo, F., "A wavelet-based approach for model and parameter identification of nonlinear systems," *International Journal of Nonlinear Mechanics,* Vol. 36, No. 5, pp. 835-859, 2001.

166. Shinozuka, M., Ghanem, R., Houshmand, B., and Mansouri, B., "Damage detection in urban areas by SAR imagery," *ASCE, Journal of Engineering Mechanics,* Vol. 126, No. 7, pp. 769-777, July 2000.

167. Pettit, C., Jones, N., and Ghanem, R. "Wavelet-based detection and classification of roof-corner pressure transients," *Wind and Structures, An International Journal,* Vol. 3, No. 3, pp. 159-175, 2000.

168. Pellissetti, M., and Ghanem, R., "Iterative solution of systems of linear equations arising in the context of the stochastic FEM," *Journal of Advances in Engineering Software,* Vol. 31, pp. 607-616, 2000.

169. Ghanem, R., and Romeo, F., "A wavelet-based approach for the identification of linear time-varying dynamical systems," *Journal of Sound and Vibration,* Vol. 234, No. 4, pp. 555-576, 2000.

170. Ghanem, R., and Red-Horse, J., "Propagation of uncertainty in complex physical systems using a stochastic finite element approach," *Physica D,* Vol. 133, No. 1-4, pp. 137-144, 1999.

171. Ghanem, R., "Higher order sensitivity of heat conduction problems to random data using the spectral stochastic finite element method," *ASME Journal of Heat Transfer,* Vol. 121, pp. 290-299, February 1999.

172. Gattulli, V., and Ghanem, R., "Adaptive control of flow-induced oscillations including vortex effects," *International Journal of Nonlinear Mechanics,* Vol. 34, No. 5, pp. 853-868, 1999.

173. Ghanem, R., "The nonlinear gaussian spectrum of lognormal stochastic processes and variables," *ASME Journal of Applied Mechanics,* Vol. 66, No. 4, pp. 964-973, 1999.

174. Ghanem, R., "Ingredients for a general purpose stochastic finite elements formulation," *Computer Methods in Applied Mechanics and Engineering,* Vol. 168 Nos. 1-4, pp. 19-34, 1999.

175. Ghanem, R., "Stochastic finite elements for heterogeneous media with multiple random non-gaussian properties," *ASCE, Journal of Engineering Mechanics,* Vol. 125, No. 1, pp. 26-40, 1999.

176. Ghanem, R., and Dham, S., "Stochastic finite element analysis for multiphase flow in heterogeneous porous media," *Transport in Porous Media,* Vol. 32, pp. 239-262, 1998.

177. Ghanem, R., "Scales of fluctuation and the propagation of uncertainty in random porous media," *Water Resources Research,* Vol. 34, No. 9, pp. 2123-2136, September 1998.

178. Ghanem, R., "Hybrid stochastic finite elements: coupling of spectral expansions with monte carlo simulations," *ASME, Journal of Applied Mechanics,* Vol. 65, pp. 1004-1009, 1998.

179. Ghanem, R., "Probabilistic characterization of transport in heterogeneous porous media," *Computer Methods in Applied Mechanics and Engineering,* Vol. 158, No. 3-4, June 1998.

180. Li, R., and Ghanem, R., "Adaptive polynomial chaos simulation applied to statistics of extremes in nonlinear random vibration,", *Probabilistic Engineering Mechanics,* Vol. 13, No. 2, pp. 125-136, 1998.

181. "State-of-the-art review on computational stochastic mechanics," Prepared by the Subcommittee on Computational Stochastic Mechanics, IASSAR, *Probabilistic Engineering Mechanics,* Vol. 12, No. 4, pp. 197-321, 1997.

182. Ghanem, R., Bujakov, M., Torikoshi, K., Itoh, H., Inazuka, T., Hiei, H., and Watanabe, T. "Adaptive control of non-linear uncertain dynamical systems," *ASCE, Journal of Engineering Mechanics,* Vol. 123, No. 11, 1997.

183. Ghanem, R., and Spanos, P.D., "Spectral techniques for stochastic finite elements," *Archives of Computational Methods in Engineering,* Vol 4, No. 1, pp. 63-100, 1997.

184. Spanos, P., Tein, W.-T., and Ghanem, R., "Heuristic spectral estimation of bivariate nonstationary processes," *Meccanica,* Vol. 31, pp. 207-218, 1996.

185. Ghanem, R., and Kruger, R., "Numerical solution of spectral stochastic finite element systems," *Computer Methods in Applied Mechanics and Engineering,* Vol 129, pp. 289-303, 1996.

186. Ghanem, R., and Brzkala, V., "Stochastic finite element analysis for randomly layered media," *ASCE Journal of Engineering Mechanics,* Vol. 122, No. 4, pp. 361-369, April 1996.

187. Ghanem, R., and Shinozuka, M., "Structural system identification: Theory," *Journal of Engineering Mechanics, ASCE,* Vol. 121, pp. 255-264, February 1995.

188. Shinozuka, M., and Ghanem, R., "Structural system identification: Experimental Verification," *Journal of Engineering Mechanics, ASCE,* Vol. 121, pp. 265-273, February 1995.

189. Ghanem, R., Spanos, P., and Swerdon, S., "Coupled in-line and transverse flow-induced vibration: higher order harmonic solutions," *Sadhana, Journal the Indian Academy of Sciences,* Vol. 20, No. 2-4, pp. 691-707, Aug 1995.

190. Ghanem, R., and Spanos, P., "A stochastic galerkin expansion for nonlinear random vibration analysis," *Probabilistic Engineering Mechanics,* Vol. 8, pp. 255-264, 1993.

191. Ghanem, R., and Spanos, P., "A Spectral stochastic finite element formulation for reliability analysis," *Journal of Engineering Mechanics, ASCE*, Vol. 117, No. 10, pp. 2351-2372, October 1991.

192. Spanos, P., and Ghanem, R., "Boundary element method analysis for random vibration problems," *Journal of Engineering Mechanics, ASCE*, Vol. 117, No. 2, pp. 409-423, February 1991.

193. Spanos, P., Tein, W.Y., and Ghanem, R., "Harmonic analysis of marine risers with time-dependent tension," *Applied Ocean Research*, Vol. 12, No.4, pp. 200-211, December 1990.

194. Ghanem, R., and Spanos, P., "Polynomial chaos in stochastic finite element," *Journal of Applied Mechanics, ASME*, Vol. 57, No. 1, pp. 197-202, March 1990.

195. Spanos, P., and Ghanem, R., "Stochastic finite element expansion for random media," *Journal of Engineering Mechanics*, ASCE, Vol. 115, No. 5, pp. 1035-1053, May 1989.

Papers in Refereed Conference Proceedings:

1. Yao, Z., Hawi, P., Aitharaju, V., Mahishi, J., and Ghanem, R., "Transfer learning for multiscale analysis: delamination of carbon-reinforced Composite Material exploration," ' *Proceedings of the American Society of Composites 40th Technical Conference,* October 21-23, 2024, San Diego, CA.

2. Hawi, P., Yao, Z., Ghanem, R., Aitharaju, V. and Mahishi, J., "Reliability based design and certification of hybrid composites," *Proceedings of the American Society of Composites 40th Technical Conference,* October 21-23, 2024, San Diego, CA.

3. R. Ghanem, V. Kumar and Z. Gou, "Probabilistic models for decision and learning in complex reactive flows," *AIAA SCITECH 2025 Forum,* 2302, (2024).

4. M Kuppa, R Ghanem, M Panesi, "Spectral Expansions Based Multi-Fidelity Surrogate Modelling for Flows in Thermochemical Non-Equilibrium," *AIAA SCITECH 2025 Forum,* 2302, (2024).

5. M Kuppa, N Singh, RG Ghanem, M Panesi, "Model Error Quantification in Non-Equilibrium Flows," *AIAA SCITECH 2024 Forum,* 0390, (2024).

6. Kuppa, M., Singh, N., Ghanem, R., and Panesi, M., (2023) "Model Error Quantification in Non-Equilibrium Flows," *AIAA SCITECH* (2024).

7. Kuppa, M., Singh, N., Rostkowski, P., Ghanem, R., and Panesi, M., (2023) "Reduced Order Modelling and Quantification of Uncertainty in Non Equilibrium Flows," *Aviation Forum,* (AIAA 2023-3331) (doi: https://doi.org/10.2514/6.2023-3331)

8. X Zeng, G Geraci, A Gorodetsky, J Jakeman, MS Eldred, RG Ghanem, "Improving Bayesian networks multifidelity surrogate construction with basis adaptation," *AIAA SCITECH* (2023).

9. M Kuppa, P Rostkowski, T Lee, R Ghanem, M Panesi " One Dimensional Modelling and Sensitivity Analysis for the ACT-II Facility, *AIAA Aviation*, 2022.

10. Subber, W., Pandita, P., Ghosh, S., Khan, G., Wang, L. and Ghanem, R. "Data-based Discovery of Governing Equations," *Association for the Advancement of Artificial Intelligence: Symposium on Combining Artificial Intelligence and Machine Learning with Physics Sciences,* Virtual Conference, March 22, 2021—March 24, 2021.

11. Dhaliwal, G., Aitharaju, A., and Ghanem, R., "Stochastic Resin Injection Simulation of the High-Pressure Resin Transfer Molding for an Automobile Floor Using Adapted Polynomial Chaos Expansions," *Proceedings of the American Society for Composites— 35th Technical Conference,* 2020.

12. Ezvan, O., Zeng, X., R Ghanem, and Gencturk, B., "Stochastic reduced-order model for spent nuclear fuel containers" *EURODYN 2020, XI International Conference on Structural Dynamics,* 23-26 November 2020, Athens, Greece.

13. S. Atkinson, W. Subber, L. Wang, G. Khan, P. Hawi, and R. Ghanem, "Data-driven discovery of free-form governing differential equations", presented at the *Workshop at the 33rd Conference on Neural Information Processing Systems (NeurIPS)* December 14 2019.

14. Ghauch, Z. and Ghanem, R., "Comparison of Multiscale and Kernel-Based Correlations for Stochastic Permeability Models in Composites Manufacturing," *American Society of Composites 34nd Technical Conference,* September 23-25, 2019, Atlanta, GA.

15. Mehrez, L. and Ghanem, R., "Experimental Validation of Multiscale Stochastic Models for Composites," *American Society of Composites 34nd Technical Conference,* September 23-25, 2019, Atlanta, GA.

16. Ghauch, Z. Aitharaju, V. R., Rodgers, W., and Pasupuleti, Dereims, A., and Ghanem, R., "Fabrication to Performance: A Comprehensive Multiscale Stochastic Predictive Model for Composites," *American Society of Composites 33nd Technical Conference,* September 23-25, 2018, Seattle, WA.

17. Mehrez, L., Ghauch, Z. Aitharaju, V. R., Rodgers, W., and Pasupuleti, Dereims, A., and Ghanem, R., "Statistical Machine Learning and Sampling for Composite Fabrication and Performance ," *American Society of Composites 33nd Technical Conference,* September 23-25, 2018, Seattle, WA.

18. Mehrez, L., Ghanem, R., Rodgers, W., and Aitharaju, V., "Polynomial Chaos Characterization of Uncertainty in Multiscale Models and Behavior of Carbon Reinforced Composites," *American Society of Composites 32nd Technical Conference,* October 23-25, 2017, West Lafayette, Indiana.

19. Mehrez, L., Ghanem, R., Rodgers, W., and Aitharaju, V., "Polynomial Chaos Characterization of Uncertainty in Multiscale Models and Behavior of Carbon Reinforced Composites," *American Society of Composites 32nd Technical Conference,* October 23-25, 2017, West Lafayette, Indiana.

20. Mehrez, L., Ghanem, R., McAuliffe, C., Rodgers, W., and Aitharaju, V., "A multiscale framework for the stochastic assimilation and modeling of uncertainty associated NCF composite materials," *ECCOMAS Congress 2016 VII European Congress on Computational Methods in Applied Sciences and Engineering,* Edited by M. Papadrakakis, V. Papadopoulos, G. Stefanou and V. Plevris, Crete Island, Greece, 5–10 June 2016

21. Thimmisetty, C., Ghanem, R, Khodabakhshnejad, A., Jabbari, N., Aminzadeh, F., Rose, K., Disenhof, C., and Bauer, J., "Multiscale Stochastic Representation in High-Dimensional Data using Gaussian Processes with Implicit Diffusion Metrics," *Dynamic Data-driven Environmental Systems Science Conference,* MIT, Cambridge, MA, Nov 5-7 2014.

22. Mehrez, L., Darabi, M., Ghanem, R., Masad, E., and Little, D., "Modeling and Propagation of Stochastic Linear Viscoelastic Material Properties of Asphalt Mixtures in Pavement Structures," *EURODYN 2014, The Ninth International Conference on Structural Dynamics,* Porto, Portugal, June 30 - July 2 2014.

23. Mehrez, L., Ghanem, R., and Masad, E., "A spectral stochastic framework for the uncertainty quantification of asphalt mixture behavior," *EMI2014: Engineering Mechanics Institute Conference,* McMaster University, Hamilton, ON, August 5-8, 2014.

24. Thimmisetty, C., Khodabakhshnejad, A., Jabbari, N., Aminzadeh, F., Ghanem, R., Rose, K., Disenhof, C., and Bauer, J., "Multiscale Stochastic Representation of Wellbore Signatures Over the Gulf of Mexico," *EMI2014: Engineering Mechanics Institute Conference,* McMaster University, Hamilton, ON, August 5-8, 2014.

25. Ghanem, R., Thimmisetty, C., Yadegaran, I., Keshavarzzadeh, V., Masri, S., Red-Horse, J., Moser, R., Oliver, T., Spanos, P., and Aldreiham, O., "A Probabilistic Approach to the NASA Langley Multidisciplinary Uncertainty Quantification Challenge Problem," *16th AIAA Non-Deterministic Approaches Conference,* National Harbor, MD January 14-17, 2014.

26. Haddad-Zadegan, H., Ghanem, R., and Hajali, P., "Data worth analysis in spatial prediction and soil remediation," *ICOSSAR'13: International Conference on Structural Safety and Reliability,* New York City, NY, June 16-20, 2013.

27. Meidani, H. and Ghanem, R., "Uncertainty quantification of diffusion maps," *ICOSSAR'13: International Conference on Structural Safety and Reliability,* New York City, NY, June 16-20, 2013.

28. Meidani, H. and Ghanem, R. "Modal Analysis of Structures under Uncertainties Using Spectral Stochastic Techniques" *14th AIAA Non-Deterministic Approaches Conference,* Honolulu, HI, April 23-26, 2012.

29. Das, S., Spall, J., and Ghanem, R. "Sensor configuration and optimization for detection of micro-anomalies in structural materials" *14th AIAA Non-Deterministic Approaches Conference,* Honolulu, HI, April 23-26, 2012.

30. Noshadravan, A. and Ghanem, R. "Identication and validation of a stochastic model for mesoscale material description of metallic polycrystals" *14th AIAA Non-Deterministic Approaches Conference,* Honolulu, HI, April 23-26, 2012.

31. Noshadravan, A., Ghanem, A. and Peralta, P., "Characterization of random heterogeneities in polycrystalline microstructures using wave propagation simulation," *Proceedings of SPIE*, 7983, 79830S, 2011.

32. Ghanem, R., Das, S., Tipireddy, R., Ghosh, S., and Paquet, D., "High resolution micrograph synthesis: a parametric texture model and a particle filter," pp. 2621-2626 *in ICOSSAR'09: Safety Reliability and Risk of Structures, Infrastructures and Engineering Systems, Edited by Furuta, Frangopol and Shinozuka,* 2009.

33. Comboul, M. and Ghanem, R., "Multiscale modeling for stochastic forest dynamics," pp. 2627-2632 *in ICOSSAR'09: Safety Reliability and Risk of Structures, Infrastructures and Engineering Systems, Edited by Furuta, Frangopol and Shinozuka,* 2009.

34. Comboul, M. and Ghanem, R., "Analysis of the value of information in the design of resilient water distribution networks," pp. 2627-2632 *in ICOSSAR'09: Safety Reliability and Risk of Structures, Infrastructures and Engineering Systems, Edited by Furuta, Frangopol and Shinozuka,* 2009.

35. Hernandez-Garcia, M., Masri, S., and Ghanem, R., "An experimental study of change detection in uncertain chain-like systems," *SMASIS 2008: Proceedings of the ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems,* Vol. 2, pp. 141-150, 2009.

36. Das, S., Spall, J., and Ghanem, R., "An efficient calculation of fisher information matrix: Monte Carlo approach using prior information," *46th IEEE Conference on Decision andControl*, pp. 5040-5045, New Orleans, LA, December 12, 2007.

37. Medina-Cetina, Z., Rechenmacher, A., and Ghanem, R., "A functional Bayesian method for the solution of inverse problems with spatio-temporal parameters," pp. 1.121-1.130, *6^{th} European LS-DYNA User's Conference,* Gothernburg, Sweden, May 28-June 1, 2007.

38. R. Ghanem, J. Red-Horse, A. Benjamin, and A. Doostan, "Stochastic process model for material properties under incomplete information," *48th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference,* Honolulu, Hawaii, April 23-26, 2007.

39. Ghanem, R., "Predictive Science: A Confluence of Verification, Validation and Uncertainty Quantification," *Proceedings of the 12th International Symposium on Dynamic Problems of Mechanics,* 2007, Ilhabela, Sao Paolo, Brazil, Feb 26-Mar 2.

40. Boctor, E., Bonfim, M., Ghanem, R., Taylor, R., Choti, M., Hager, G., Fichtinger, G., "Ultrasound Monitoring of Tissue Ablation via Deformation Model and Shape Priors," *9th MICCAI, Medical Image Computing, Computer-Assisted Intervention Conference,* October 1-6, 2006, Coppenhagen, Denmark.

41. Masri, S., Ghanem, R., and Hernandez,Garcia, M., "Data-based stochastic models of uncertain dynamical systems," *IUTAM Symposium on Dynamics and Control of Nonlinear Systems with Uncertainty,* Nanjing University of Aeronautics and Astronautics, Nanjing, China, September 18-22 2006.

42. Ghanem, R. and Ferro, G., "The Ensemble Kalman Filter for the Analysis of Nonlinear Dynamical Systems," *4th World Conference on Structural Control and Monitoring,* LaJolla, CA 11-13 July, 2006.

43. Sarkar, A., Bennabou, N. and Ghanem, R., "Domain decomposition of stochastic PDEs and its parallel implementation," *The* 20^{th} *International Symposium on High-Performance Computing Systems and Applications,* May 14-17 2006, Memorial University of Newfoundland, St. John's, Canada.

44. Sarkar, A., Bennabou, N. and Ghanem, R., "Domain decomposition of stochastic systems," *47th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics & Materials Conference, 14th AIAA/ASME/AHS Adaptive Structures Conference, 7th AIAA Gossamer Spacecraft Forum, 2nd AIAA Multidisciplinary Design Optimization Specialist Conference, and 1st AIAA Non-Deterministic Approaches,* May 1-4 2006, Newport Beach, RI.

45. Das, S., Ghanem, R. and Spall, J.C., "Asymptotic sampling distribution for polynomial chaos representation of data: A Maximum Entropy and Fisher information approach," Proceedings of the 45th IEEE Conference on Decision and Control, December 14, 2006.

46. LeMaitre, O., Najm, H., Knio, O., and Ghanem, R., "Adaptive decomposition technique for uncertainty quantication," 6^{th} *European Conference on Structural Dynamics, Eurodyn-2005,* Paris, France, September 4-7, 2005.

47. Das, S. and Ghanem, R. "Hybrid representations for complex dynamical stochastic systems: coupled non-parametric and parametric models," 6^{th} *European Conference on Structural Dynamics, Eurodyn-2005,* Paris, France, September 4-7, 2005.

48. Malek, S., Wojtkiewicz, S., and Ghanem, R. "Stochastic modeling of complex dynamical systems," 6^{th} *European Conference on Structural Dynamics, Eurodyn-2005,* Paris, France, September 4-7, 2005.

49. Desceliers, C., Ghanem, R., and Soize, C., "Stochastic fields: application to the elastodynamics of a random elastic medium," 6^{th} *European Conference on Structural Dynamics, Eurodyn-2005,* Paris, France, September 4-7, 2005.

50. Doostan, A. and Ghanem, R., "Characterization of stochastic system parameters from experimental data: A Bayesian inference approach," 9^{th} *International Conference on Structural Safety and Reliability, ICOSSAR'05,* Rome, Italy, June 19-22, 2005.

51. Hayek, C. and Ghanem, R., "Natural Hazards: Optimal insurance portfolio and coverage resolution," 9^{th} *International Conference on Structural Safety and Reliability, ICOSSAR'05,* Rome, Italy, June 19-22, 2005.

52. Sarkar, A., Benabbou, N. and Ghanem, R. "Stochastic domain decomposition in mid-frequency acoustics: Multi-level parallelization using massage passing & explicit multi-threading," 9^{th} *International Conference on Structural Safety and Reliability, ICOSSAR'05,* Rome, Italy, June 19-22, 2005.

53. Ghanem, R. and Red-Horse, J., "Orthogonal representations of stochastic processes and their propagation in mechanics," *43rd IEEE Conference on Decision and Control,* Bahamas, December 14-17, 2004.

54. Medina-Cetina Z., Rechenmacher A.L. and Ghanem, R.G., "Parameterization of Constitutive Models Using Data from 3D Displacement Fields and the Theory of the Inverse Problem," Proceedings of the 20th National Conference on Soil Mechanics, Guadalajara Jal. Mexico, November 18-20, 2004.

55. Faverjon, B. and Ghanem, R., "Stochastic models for acoustic scattering in noisy media," *WCCM VI: World Congress on Computational Mechanics,* Beijing, China September 5-10 2004.

56. Shi, J. and Ghanem, R., (keynote lecture) "Nonlocal modeling of heterogeneous materials with mesoscale features," *WCCM VI: World Congress on Computational Mechanics,* Beijing, China September 5-10 2004.

57. Zou, Y. and Ghanem, R., "Kalman filtering for multi-scale data assimilation," *WCCM VI: World Congress on Computational Mechanics,* Beijing, China September 5-10 2004.

58. Hayek, C. and Ghanem, R. "Portfolio optimization and value of information on catastrophe insurance," 13^{th} *World Conference on Earthquake Engineering,* , Vancouver, B.C., Canada, August 1-6, 2004.

59. Faverjon, B. and Ghanem, R. "A new stochastic formulation for inverse problems," *Eleventh International Congress on Sound and Vibration,* St. Petersburg, Russia, 5-8 July 2004.

60. Faverjon, B. and Ghanem, R. "Stochastic parametrization of random shapes in inverse acoustic scattering," 9^{th} *ASCE EMD-SEI-GI-AD Joint Specialty Conference on Probabilistic Mechanics and Structural Reliability,* Albuquerque, NM , July 26-28, 2004.

61. Ghanem, R. and Red-Horse, J."Optimal representations of stochastic processes," 9^{th} *ASCE EMD-SEI-GI-AD Joint Specialty Conference on Probabilistic Mechanics and Structural Reliability,* Albuquerque, NM , July 26-28, 2004.

62. Ghanem, R. and Doostan, A. "A-posteriori error estimates for the spectral stochastic FEM based on hierarchical bases," 9^{th} *ASCE EMD-SEI-GI-AD Joint Specialty Conference on Probabilistic Mechanics and Structural Reliability,* Albuquerque, NM , July 26-28, 2004.

63. Desceliers, C., Ghanem, R. and Soize, C. "Stochastic conditioner for accelerating convergence of Monte Carlo simulations," 9^{th} *ASCE EMD-SEI-GI-AD Joint Specialty Conference on Probabilistic Mechanics and Structural Reliability,* Albuquerque, NM , July 26-28, 2004.

64. Rechenmacher, A., Medina-Cetina, Z., and Ghanem, R. "Calibration of soil constitutive models with heterogeneous parameters," 9^{th} *ASCE EMD-SEI-GI-AD Joint Specialty Conference on Probabilistic Mechanics and Structural Reliability,* Albuquerque, NM , July 26-28, 2004.

65. Shi, J. and Ghanem, R., (keynote lecture) "Nonlocal modeling of heterogenous multiscale systems," 9^{th} *ASCE EMD-SEI-GI-AD Joint Specialty Conference on Probabilistic Mechanics and Structural Reliability,* Albuquerque, NM , July 26-28, 2004.

66. Ghanem, R. and Red-Horse, J., "Spectral representations of stochastic processes for applications in PDEs," *International Conference On Spectral and High Order Methods (ICOSAHOM) 2004,* Brown University, Providence, RI, June 21-25 2004.

67. Le Maitre, O., Knio, O., Najm, H. and Ghanem, R., "Adaptive multi-wavelets decomposition for stochastic processes," *International Conference On Spectral and High Order Methods (ICOSAHOM) 2004,* Brown University, Providence, RI, June 21-25 2004.

68. Najm, H., Reagan, M., Debusschere, B., Knio, O., Ghanem, R. and Le Maitre, O., "Spectral stochastic uncertainty quantification in chemical systems," *International Conference On Spectral and High Order Methods (ICOSAHOM) 2004,* Brown University, Providence, RI, June 21-25 2004.

69. Moon, S.-J., Ghanem, R. and Kevrekidis, I. "A coarse-grained approach to coupled oscillator dynamics," *International Conference On Spectral and High Order Methods (ICOSAHOM) 2004,* Brown University, Providence, RI, June 21-25 2004.

70. Loh, K. Shinozuka, M., Mansouri, B., and Ghanem, R., "Structural damage detection and identification using synthetic aperture radar (SAR)," *EM 2004, the* 17^{th} *ASCE Engineering Mechanics Conference,* Newark, Delaware, June 13-16 2004.

71. Faverjon, B. and Ghanem, R., "Modeling errors in stochastic inverse problems," *EM 2004, the* 17^{th} *ASCE Engineering Mechanics Conference,* Newark, Delaware, June 13-16 2004.

72. Ghosh, D. and Ghanem, R., "Random eigenvalue analysis of an airframe," *45th AIAA/ASME/ASCE/ /AHS/ASC Structures, Structural Dynamics & Materials Conference,* Palm Springs, California, 19-22 Apr 2004.

73. Das, S. and Ghanem, R. "Uncertainty analysis for marine structure subjected to underwater detonation," *IMAC XXII: Conference & Exposition on Structural Dynamics,* Dearborn, MI January 26-29, 2004.

74. Ghosh, D. and Ghanem, R. "Modal Interaction of Random Dynamical Systems," *IMAC XXII: Conference & Exposition on Structural Dynamics,* Dearborn, MI January 26-29, 2004.

75. Ghanem, R., and Red-Horse, J. "Effect of Joint Linearization on the Probabilistic Predictions in Dynamical Systems," *IMAC XXII: Conference & Exposition on Structural Dynamics,* Dearborn, MI January 26-29, 2004.

76. Ghosh, D., Ghanem, R. and Pettit, C. "Polynomial chaos representation of stochastic eigenmodes of complex structures," *3rd Modeling and Simulation Subcommittee Meeting of the Joint Army-Navy-NASA-Air Force (JANNAF) Joint Meeting*, Colorado Springs, CO, December 1-5, 2003.

77. Das, S. and Ghanem, R. "Uncertainty analysis in ship shock modelling and simulation," 74^{th} *Shock and Vibration Symposium,* San Diego, CA October 27-30 2003.

78. Rechenmacher, A., Medina-Cetina, Z., and Ghanem, R. "Identification of the heterogeneous structure of soil constitutive models from boundary feedback," *5th EUROMECH Solid Mechanics Conference,* Thessaloniki, Greece, August 17-22, 2003.

79. Rechenmacher, A., Medina-Cetina, Z., and Ghanem, R. "Predictions of heterogeneous soil behavior: assimilation of digital imagery into finite element models of sand," *LSD2003: International Workshop on Limit State Design in Geotechnical Engineering Practice,* Cambridge, MA June 26 2003.

80. Shi, J. and Ghanem, R., "Nonlocal modeling of materials with random subscale interaction," *16th ASCE Engineering Mechanics Conference,* July 16-18, Seattle, WA 2003.

81. Ghosh, D., Ghanem, R. and Pettit, C., "Stochastic buckling analysis of a joined-wing," *Stochastic Dynamics Conference, '03,* Hangzhou, China, May 26-28, 2003.

82. Reagan, M., Najm, H., Ghanem, R. and Knio, O., "Analysis of parametric uncertainty propagation in detailed combustion chemistry," *Second MIT Conference on Computational Mechanics,* Cambridge, MA, June 17-20, 2003.

83. Ghanem, R. and Abras, J. "A general purpose library for stochastic finite element computations," *Second MIT Conference on Computational Mechanics,* Cambridge, MA, June 17-20, 2003.

84. Debusschere, B., Najm, H., Matta, A., Knio, O., Ghanem, R., and Le Maitre, O., "Study of sample dispersion mechanisms in an electroosmotically pumped microchannel," *Sixth International Conference on Modeling and Simulation of Microsystems,* San Francisco, CA February, February 2003.

85. Ghanem, R. and Ghosh D., "A novel characterization of the random eigenvalue problem," *The Fifth European Conference on Structural Dynamics, EURODYN-2002*, Munich, Sep 2-5, 2002.

86. Debusschere, B., Najm, H., Matta, A., Shu, T., Knio, O., Ghanem, R., and Le Maitre, O.P. "Uncertainty quantification in a reacting electrochemical microchannel flow model," *Proceedings of the Fifth International Conference on Modeling and Simulation of Microsystems,* pp. 384-387, 2002.

87. Debusschere, B., Najm, H., Matta, A., Knio, O., Ghanem, R., and Le Maitre, O., "Numerical simulation and quantitative uncertainty assessment of microchannel flow," Presented at the 55th annual meeting of the APS Division of Fluid Dynamics, Dallas, TX, Nov. 2002.

88. Reagan, M., Najm, H., Ghanem, R., and Knio, O., "Uncertainty quantification in reacting-flow simulations through non-intrusive spectral projection," *29th International Symposium on Combustion,* Sapporo, Japan, July 21-26, 2002.

89. Ghanem, R., and Shi, J., "A stochastic multi-scale characterization of heterogeneous materials," *Fourth International Conference on Computational Stochastic Mechanics,* Corfu, Greece, June 9-12, 2002.

90. Clouteau, D., Lafargue, R., and Ghanem, R., "An iterative solver for stochastic soil-structure interaction," *Fourth International Conference on Computational Stochastic Mechanics,* Corfu, Greece, June 9-12, 2002.

91. Beolchini, G.C., Gattulli, V., and Ghanem, R., "Data fusion in bridge health monitoring for management," *International Conference on Bridge Management and Safety, IABMAS'02,* Barcelona, July 14-16, 2002.

92. Ghanem, R., and Pellissetti, M., "Error estimation for the validation of model-based predictions," *The Fifth International World Congress Computational,* Vienna, Austria, July 7-12, 2002.

93. Ghanem, R., and Pellissetti, M., "A method for the validation of predictive computations using a stochastic approach," *The* 21st *International Conference on Offshore Mechanics and Arctic Engineering,* Oslo, Norway, 23-28 June, 2002.

94. Ghanem, R., and Shi, J., "A stochastic strain-dependent characterization of heterogeneous materials," *The* 21st *International Conference on Offshore Mechanics and Arctic Engineering,* Oslo, Norway, 23-28 June, 2002.

95. El-Hayek, C., and Ghanem, R., "Impact of uncertainty in catastrophe losses on insurance derivatives," *the* 15^{th} *ASCE Specialty Conference on Engineering Mechanics,* Columbia University, New York, June 2-5, 2002.

96. El-Khoury, M. and Ghanem, R., M., "MechML: A draft XML for mechanics," *the* 15^{th} *ASCE Specialty Conference on Engineering Mechanics,* Columbia University, New York, June 2-5, 2002.

97. Jardak, M. and Ghanem, R., "Spectral stochastic homogenization," *the* 15^{th} *ASCE Specialty Conference on Engineering Mechanics,* Columbia University, New York, June 2-5, 2002.

98. Red-Horse, J., and Ghanem, R., "Stochastic finite element analysis of a three dimensional foam", 43^{rd} *Structural Dynamics and Materials Conference,* Denver, CO, April 22-25, 2002.

99. Red-Horse, J. and Ghanem, R. "Assessing effects of stochastic materials in structural shock environments," *and Materials Conference,* Denver, CO, April 22-25, 2002.

100. Debusschere, B., Najm, H., Knio, O., and Ghanem, R., "Uncertainty quantification of protein labeling simulations in a microchannel," Presented at the 54^{th} annual meeting of the APS Division of Fluid Dynamics, San Diego, CA, Nov. 2001.

101. Ghanem, R., and Sarkar, A., "Numerical analysis of stochastic dynamical systems in the medium frequency range," *NATO Symposium on Developments in Computational Aero- and Hydro-Acoustics,* UK, October 8-11, 2001.

102. Ghanem, R., Malek, S., and Tazoh, T., "Identification of pile head impedance from experimental data," *10th International Conference on Soil Dynamics and Earthquake Engineering,* Philadelphia, PA, October 7-10, 2001.

103. Clouteau, D. and Ghanem, R. "Accounting for data uncertainties in numerical modeling of dynamic soil-structure interaction," *1st Albert Caquot International Conference: Modelling and Simulation in Civil Engineering : from Practice to Theory,* Paris, France, 3-5 October 2001.

104. Clouteau, D., Degrange, G., and Ghanem, R., "Stochastic modeling of traffic-induced vibrations and validation," *1st Albert Caquot International Conference: Modelling and Simulation in Civil Engineering : from Practice to Theory,* Paris, France, 3-5 October 2001.

105. Ghanem, R. and Francesco, R., "Identification of nonlinear time-varying dynamical systems in the wavelet domain," *18th ASME Biennial Conference on Mechanical Vibration and Noise,* Pittsburgh, PA, September 9-13, 2001.

106. Ghanem, R., and Hayek B., "Propagation and management of uncertainty in coupled hydrological processes," *International Workshop on Catchment Scale Hydrological Modeling and Data Assimilation,* Wageningen, The Netherlands, September 3-5, 2001.

107. Ghanem R., "Stochastic error estimation: Integrated data and mesh resolutions," *First MIT Conference on Computational Mechanics,* Cambridge, MA, June 11-15, 2001.

108. Shi, J., and Ghanem, R., "Crack initiation prediction of welded components of random materials: a stochastic finite element analysis," *Sixth International Conference on Structural Safety and Reliability, ICOSSAR'01* Newport Beach, CA, June 17-22, 2001.

109. Ghanem, R., and Pellissetti, M., "Stochastic adaptive refinement: An s-type error estimator," *Sixth International Conference on Structural Safety and Reliability, ICOSSAR'01* Newport Beach, CA, June 17-22, 2001.

110. Sarkar, A. and Ghanem, R., "Mid-frequency vibration of complex uncertain systems," *Sixth International Conference on Structural Safety and Reliability,* Newport Beach, CA, June 17-22, 2001.

111. Ghanem, R., "Uncertainty characterization, propagation and management in model-based predictions," Teknea, editor, 5^{eme} *Colloque National en Calcul des Structures,* pp. 59-73, Giens, France, 15-18 May 2001.

112. Sarkar, A., and Ghanem, R., "Mid-frequency structural dynamics with parameter uncertainty," 42^{nd} *AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference,* Seattle, WA, April 16-19 2001.

113. Le-Maitre, O.P., Knio, O.M., Ghanem, R.G., and Najm, H.N., "A Stochastic projection method for microchannel flow," *Proceedings of the Fourth International Conference on Modeling and Simulation of Microsystems,* pp. 246-249, Hilton Head, SC, March 19-21, 2001.

114. Le Maitre, O., Knio, O., Ghanem, R., & Najm, H., "Propagation of uncertainty in viscous flow using stochastic spectral method," presented at *ICFD Conference on Numerical Methods in Fluid Dynamics,* Oxford UK, March 26–29, 2001.

115. Ghanem, R. and Knio, O., "A probabilistic framework for the validation and certification of computer simulations," *1st Modeling and Simulation Subcommittee Meeting of the Joint Army-Navy-NASA-Air Force (JANNAF) Joint Meeting*, Monterrey, CA, November 13-17, 2000.

116. Ghanem, R. and Sarkar, A., "Structural-acoustic analysis of stochastic systems," *ECCOMAS 2000, European Congress on Computational Methods in Applied Sciences and Engineering,* Barcelona, Spain, September 11-14, 2000.

117. Ghanem, R., "Stochastic adaptive refinement: coupling of mesh and data resolutions," *16th IMACS World Congress,* Lausanne, Switzerland, August 21-25, 2000.

118. Ghanem, R., "Propagation of uncertainty in mechanistic models of soil," *GeoDenver, Conference of the ASCE Geo-Institute,* Denver, CO, August 5-8, 2000.

119. Ghanem, R., Sarkar, A., Abousleiman, Y., Bao M., "A mechanistic approach to the management of uncertainty in reservoir characterization," *The Fourth North American Rock Mechanics Symposium,* Seattle, WA, July 31-Aug 3, 2000.

120. Ghanem, R., and Romeo, F., "Identification of nonlinear time-varying dynamical systems in the wavelet domain," *7th International Congress on Sound and Vibration,* Garmisch-Partenkirchen, Germany, on 4-7 July 2000.

121. Ghanem, R., and Sarkar, A., "Medium-frequency range dynamics of stochastic systems," *7th International Congress on Sound and Vibration,* Garmisch-Partenkirchen, Germany, on 4-7 July 2000.

122. Ghanem, R., Red-Horse, J., Sarkar, A., "The Modal Properties of a Space-Frame with Localized System Uncertainties," *PMC2000, ASCE Probabilistic Mechanics Conference,* Notre Dame, IN, June 24-26, 2000.

123. El-Mestkawy, M., and Ghanem, R., "Modeling of the Dynamic Behavior of a Probabilistic Soil Fabric with the Discrete Element Method," *PMC2000, ASCE Probabilistic Mechanics Conference,* Notre Dame, IN, June 24-26, 2000.

124. Ghanem, R., and Sakamoto, S., "Simulation of non-gaussian non-stationary processes," *MCS 2000: International Conference on Monte Carlo Simulation,* Monte Carlo, Monaco, June 18-21, 2000.

125. Ghanem, R., "An Iterative least-squares approach to model update in structural mechanics," *the* 14^{th} *ASCE Specialty Conference on Engineering Mechanics,* the University of Texas, Austin, May 22-24, 2000.

126. Ghanem, R., and Sarkar, A., "The Medium-frequency range vibration of coupled fluid-structure assembly with system uncertainty" *the* 14^{th} *ASCE Specialty Conference on Engineering Mechanics,* the University of Texas, Austin, May 22-24, 2000.

127. Ghanem, R. and Wang, Z., "Molecular dynamics and fractional differential models for chain dynamics in fluidic suspensions," *the* 14^{th} *ASCE Specialty Conference on Engineering Mechanics,* the University of Texas, Austin, May 22-24, 2000.

128. Ghanem, R. and El-Mestkawy, M., "Probabilistic modeling of soil liquefaction with the discrete element method," *the* 14^{th} *ASCE Specialty Conference on Engineering Mechanics,* the University of Texas, Austin, May 22-24, 2000.

129. Ghanem, R., "Stochastic error control in finite element analysis of flows in random porous media," *Finite Elements in Flow Problems 2000,* the University of Texas, Austin, April 30-May 4, 2000.

130. Ghanem, R., "Decision analysis and experiment design using the spectral stochastic finite element method," *Euromech 405: Numerical Modelling of Uncertainties,* Valenciennes, France, November 17-19, 1999.

131. Pellissetti, M., and Ghanem, R., "Iterative solution of systems of linear equations arising in the context of the stochastic FEM," 5th NASA National Symposium on Large Scale Analysis, Design, and Intelligent Synthesis Environments, October 12-15, 1999, Williamsburg, VA.

132. Pettit, C.L., Jones, N.P., and Ghanem, R., "Detection, analysis, and simulation of roof-corner pressure transients," *10th International Conference on Wind Engineering, Copenhagen, Denmark* June 1999.

133. Sakamoto, S., and Ghanem, R., "Simulation of non-gaussian fields with the Karhunen-Loève and Polynomial Chaos expansions," 13^{th} *ASCE Engineering Mechanics Conference,* The Johns Hopkins University, Baltimore, MD June 13-16 1999.

134. Ghiocel, D., and Ghanem, R., "A Computational SSI study on nonsynchroneous motion effects for structures with torsional eccentricities," 13^{th} *ASCE Engineering Mechanics Conference,* The Johns Hopkins University, Baltimore, MD June 13-16 1999.

135. Gattulli, V., and Ghanem, R., "Position and flexural control of an offshore structure in the presence of uncertain dynamics," *International Conference on Monitoring and Control of Marine and Harbour Structures,* Genoa, Italy, June 1-4, 1999.

136. Ghanem, R., and Sakamoto, S., "Dynamic analysis of framed structures with uncertain connections," *EURODYN,* Prague, June 7-10, 1999, Fryba & Narpstek Editors, Balk ema, Rotterdam.

137. Red-Horse, J., and Ghanem, R., "Polynomial chaos representation of the random eigenvalue problem", 40^{th} *Structures, Structural Dynamics, and Materials Conference,* St. Louis, MS., April 12-15, 1999.

138. Red-Horse, J., and Ghanem, R., "Uncertainty propagation using a stochastic finite element approach," *IMAC-XVII,* Orlando, Fl., February 8-11, 1999.

139. Eguchi, R., Seligson, H.P., Houshmand, B., Tralli, D., Shinozuka, M., and Ghanem, R., "Application of remote sensing technologies for real-time damage assessment," *Conference on Remote Sensing and GIS for Disaster Management,* Washington DC January 1999.

140. Ghanem, R., and Romeo, F., "System identification in the wavelet domain," 11^{th} *European Conference on Earthquake Engineering,* Paris, September 1998.

141. Ghanem, R., and Gattulli, V., "Direct model reference adaptive control of nonlinear hydrodynamic oscillations," 2^{nd} *World Congress on Structural Control,* Kyoto, Japan, June 28-July 1, 1998.

142. Ghanem, R., "Thermal conduction in the presence of uncertain material properties," *1998 ASME/AIAA Joint Thermophysics and Heat Transfer Conference, session on Uncertainty Analysis in Computational Heat Transfer,* Albuquerque, NM, June 15-18, 1998.

143. Ghanem, R. "Nonlinear gaussian spectrum of lognormal processes and application to the SFEM," *ASCE* 12^{th} *Engineering Mechanics Conference,* La Jolla, CA, May 17-20, 1998.

144. Ghanem, R., and Ghiocel, D., "A new implementation of the spectral stochastic finite element method for stochastic constitutive relations," *ASCE* 12^{th} *Engineering Mechanics Conference,* La Jolla, CA, May 17-20, 1998.

145. Ghanem, R., and El-Mestkawy, M., "Efficient statistically equivalent representations of random packings with random shapes," *ASCE* 12^{th} *Engineering Mechanics Conference,* at La Jolla, CA, May 17-20, 1998.

146. Ghanem R., and Ghiocel, D., "Stochastic seismic soil-structure interaction using the homogeneous chaos expansion," *ASCE* 12^{th} *Engineering Mechanics Conference,* La Jolla, CA, May 17-20, 1998.

147. Ghanem, R., and Romeo, F., "Identification of dynamical systems from their projection on wavelet bases," *ASCE* 12^{th} *Engineering Mechanics Conference,* La Jolla, CA, May 17-20, 1998.

148. Pettit, C.L., Jones, N.P., and Ghanem, R., "Analysis of pressure transients via wavelet analysis and pattern classification," *ASCE* 12^{th} *Engineering Mechanics Conference,* La Jolla, CA, May 17-20, 1998.

149. Ghanem, R. and Romeo, F., "Application of wavelets in structural system identification," *SEM* 16^{th} *International Modal Analysis Conference,* Santa Barbara, CA on Feb 2, 1998, Part 1, pp. 422-428.

150. Ghanem, R., "Hybrid stochastic finite elements: Analytical methods and simulation techniques join hands," *Seventh International Conference on Structural Safety and Reliability, ICOSSAR'97, Kyoto, Japan, November 24-28, 1997.*

151. Gattulli, V., and Ghanem, R. "Adaptive control of flow-induced vibrations with vortex-induced dynamics," *Seventh International Conference on Structural Safety and Reliability, ICOSSAR'97, Kyoto, Japan, November 24-28, 1997.*

152. Ghanem, R., and El-Mestkawy, M., "Discrete element analysis of random packing of randomly shaped granules," *Seventh International Conference on Structural Safety and Reliability, ICOSSAR'97, Kyoto, Japan, November 24-28, 1997.*

153. Gattulli, V., and Ghanem, R., "Adaptive control of vortex-induced oscillations," *AIMETA'97, 13th Italian Conference on Theoretical and Applied Mechanics,* Siena, Italy, September 29-October 3, 1997.

154. Ghanem, R., "Decision support for flow in porous media: Optimal sampling for data assimilation," *Fourth International Conference on Computer Methods and Water Resources, CMWR'97,* Byblos, Lebanon, June 16-18, 1997.

155. Ghanem, R., "Hybrid stochastic finite elements and generalized Monte Carlo Simulation," *ASCE 1996 Specialty Conference on Probabilistic Mechanics and Structural Reliability*, Worcester, MA, August 7-9, 1996, pp. 182-185.

156. Ghanem, R., "A Comparative assessment of various deterministic prediction strategies for adaptive control," *ASCE 1996 Specialty Conference on Probabilistic Mechanics and Structural Reliability*, Worcester, MA, August 7-9, 1996, pp. 134-137.

157. Dham, S., and Ghanem, R., "A stochastic finite element analysis for multiphase flow in random porous media," *ASCE Specialty Conference, Proceedings Non-Aqueous Phase Liquids (NAPLs) in the Subsurface Environment: Assessment and Remediation,* Washington, D.C., November 12-14, 1996, pp. 661-669.

158. Ghanem, R., and Tazoh, T., "Model update and damage localization in structural mechanics," *Proceedings of Eurodyn'96*, Edited by G. Augusti, C. Borri, and P. Spinelli, pp. 989-995, Florence, June 5-8, 1996.

159. Ghanem, R., and Ghiocel, D., "A comparative analysis of FORM/SORM and series expansions for highly nonlinear systems," *Proceedings of the* 11^{th} *ASCE Specialty Conference on Engineering Mechanics*, Edited by Y.K. Lin and T.C. Su, ASCE, pp. 535-538, Fort Lauderdale, Fl., May 19-22, 1996, pp. 535-538.

160. Ghanem, R., and Grigoriu, M., "Stochastic prediction and control of uncertain nonlinear dynamical systems," *Proceedings of the* 11^{th} *ASCE Specialty Conference on Engineering Mechanics*, Edited by Y.K. Lin and T.C. Su, ASCE, pp. 277-280, Fort Lauderdale, Fl., May 19-22, 1996, pp. 277-280.

161. Ghanem, R., Tazoh, T., Li, R., and Shimizu, K., "Identification of pile-head impedance from experimental data," *Proceedings of CERRA-ICASP 7, Seventh International Conference on Applications of Statistics and Probability in Civil Engineering,* Edited by M. Lemaire, J.-L. Favre, and A. Mebarki, pp. 1335-1339, Paris, France, July 1995.

162. Ghanem, R. and Dham, S., "Stochastic characterization of multiphase flow in random porous media," *Third International Conference on Computer Methods and Water Resources, CMWR'95,* Beirut, Lebanon, 1995.

163. Ghanem, R., "Stochastic finite element analysis of coupled flow problems," *Proceedings of the* 10^{th} *ASCE Specialty Conference on Engineering Mechanics,* Edited by S. Sture, pp. 329-332, Boulder, CO, May 1995.

164. Ghanem, R., and Green, M., "Transport of trichloroethylene vapors in a random porous medium," *Geoenvironment 2000, Geotechnical Special Publication, Proceedings of the Specialty Conference on Geotechnical Practice in Waste Disposal, ASCE,* pp. 300-314, New Orleans, February 1995.

165. Ghanem, R., and Bujakov, M., "Adaptive control of nonlinear dynamical systems with uncertainties," *First World Conference on Structural Control,* Los Angeles, 3-5 August 1994, pp. TA4-23-TA4-32.

166. Ghanem, R., and Li, R., "Polynomial chaos expansion applied to statistics of extremes in nonlinear random vibration," *Fifth U.S. National Conference on Earthquake Engineering,* Chicago on July 10-14, 1994.

167. Ghanem, R., H. Seya, Y. Shigeno, and T. Shiomi, "Stochastic finite element analysis for the transport of Trichloroethylene," *International Conference on Computational Methods in Water Resources,* Heidelberg, Germany, July 1994.

168. Dham, S., and Ghanem, R., "Finite element analysis of multiphase flow in porous media with the Polynomial Chaos expansion," *Second International Conference on Computational Stochastic Mechanics,* Athens, Greece, June 1994, pp. 429-434.

169. Li, R., and Ghanem, R., "Polynomial Chaos cubicization applied to the simulation of extreme events," *Second International Conference on Computational Stochastic Mechanics,* Athens, Greece, June 1994, pp. 337-342.

170. Shinozuka, M., Ghanem, R., and Constantinou, M., "Adaptive structural systems," *International Conference on Intelligent Materials,* Charlotsville, West Virginia, June 1994, p. 1131-1141.

171. Ghanem, R., and Brzakala, V., "Stochastic finite element analysis for layered geotechnical media," 8^{th} IACMAG, Morgantown, West Virginia, May 22-28, 1994.

172. Ghanem, R., Shinozuka, M., Seya, H., Shigeno Y., and Shiomi, T, "Stochastic sensitivity analysis for the transport of trichloroethylene vapors in the unsaturated zone," 8^{th} IACMAG, Morgantown, West Virginia, May 22-28, 1994, pp. 1061-1066.

173. Elkordy, M., Ghanem, R., Lee, G.C., "Structural system identification using neural networks," *International Symposium on Uncertainty Modeling and Analysis, ISUMA'93,* University of Maryland, April 25-28 1993, pp. 1981-1986.

174. Ghanem, R., and Shinozuka, M., "Comparative analysis of system identification techniques for earthquake engineering applications," *Sixth International Conference on Structural Safety and Reliability, ICOSSAR'93,* Innsbruck, Austria, August 9-13 1993.

175. Ghanem, R., and Spanos, P., "A new computational framework for nonlinear random vibration," *Sixth International Conference on Structural Safety and Reliability, ICOSSAR'93,* Innsbruck, Austria, on August 9-13 1993.

176. Ghanem, R., and Brzakala, V., "Stochastic finite element analysis of soil layers with random interface," *Sixth International Conference on Structural Safety and Reliability, ICOSSAR'93,* Innsbruck, Austria, on August 9-13 1993.

177. Spanos, P., Ghanem, R., and Bhattacharjee, S., "Modelling aspects of wave kinematics in offshore structures," *12th International Conference on Offshore Mechanics and Arctic Engineering, ASME* Glasgow, Scotland on June 20-24, 1993, pp. 213-217.

178. Shinozuka, M., Ghanem, R., and Gavin, H., "Recursive system identification in earthquake engineering," *10th World Conference on Earthquake Engineering,* July 1992.

179. Spanos, P., Tein, W.Y., and Ghanem, R., "Spectral estimation for bivariate non-stationary processes," *10th World Conference on Earthquake Engineering,* Spain, July 1992.

180. Ghanem, R., and Spanos, P., "Polynomial Chaos for nonlinear random vibration," *ASCE Specialty Conference on Probabilistic Mechanics, and Structural and Geotechnical Reliability,* Denver, CO, July 8-10, 1992, pp. 404-407.

181. Ghanem, R., Spanos, P., and Swerdon, S., "Coupled in-line and transverse flow-induced vibration: higher order harmonic solutions," *ASME,* 11^{th} *International Conference on Offshore Mechanics and Arctic Engineering,* Calgary, Canada, June $7^{th} - 11^{th}$, 1992, pp. 377-384.

182. Ghanem, R., and Spanos, P., "Stochastic finite element analysis with curved boundaries," *Sixth International Conference on Applications of Statistics and Probability in Civil Engineering,* Mexico City, Mexico, June 1991.

183. Ghanem, R., and Spanos, P., "A Spectral formulation of stochastic finite elements," invited paper, *10th International Invitational Symposium on the Unification of Finite Element Methods,* pp.59-82, Worcester Polytechnic Institute, July, 1991.

184. Ghanem, R., and Spanos, R., "Structural response statistics by boundary elements," *ASCE Engineering Mechanics Specialty Conference: Mechanics Computing in 1990's and Beyond,* Columbus Ohio, May 20-22, 1991, pp. 168-172.

185. Tein. W.Y., Spanos, P., and Ghanem, R., "Microcomputer analysis of marine risers with time dependent tension," *Proceedings of the* 9^{th} *Conference on Offshore Mechanics and Arctic Engineering,* pp. 345-351, February 1990.

186. Ghanem, R. and Spanos, P., "Galerkin-based response surface approach for reliability analysis," *Proceedings of the* 5^{th} *International Conference on Structural Safety and Reliability,* San Francisco, CA., pp. 1081-1088. August 8-11, 1989.

187. Ghanem, R., Spanos, P., and Akin, E., "Orthogonal expansion for beam variability," *Proceedings of the Conference on Probabilistic Engineering Mechanics,* pp. 156-159, Blacksburg, Va., May 25-27, 1988.

Papers and Abstracts in Non-Refereed Conference Proceedings:

1. R. Ghanem, A. Shresta, N. Jackson, C. Safta, and J.P. Watson, "Characterization of power grid failure as extremes in diffusion coordinates on a graph," *Joint Mathematics Meeting,* January 5 2024, San Francisco, 2024

2. R. Ghanem, A. Shresta, N. Jackson, C. Safta, and J.P. Watson, "Managing Powergrid Outages Driven by Climatic Extremes," *SIAM UQ Conference,* Trieste, Italy, Feb 27-Mar 1, 2024.

3. Gou, Z., Lototsky, S. and Ghanem, R., "Extremes of Switching Diffusion Models," *SIAM UQ Conference,* Trieste, Italy, Feb 27-Mar 1, 2024.

4. Ghanem, R., Tang, Q., Hsiang-He, L. and Wang, Z., "Data assimilation in the small data limit: Application to wildfire smoke in the stratosphere," *SIAM UQ Conference,* Trieste, Italy, Feb 27-Mar 1, 2024.

5. McCoy, K. and Ghanem, R., "An End-to-end Digital Twin Paradigm for Space missions: Fuel the Analytics," *SIAM UQ Conference,* Trieste, Italy, Feb 27-Mar 1, 2024.

6. Gou, Z. and Ghanem, R., *SIAM Conference on Mathematics of Data Science,* Atlanta, GA, Oct 21-25, 2024.

7. Ghanem, R., Tsilifis, P. and Biller, D., "Statistical Learning and Inference in the Small Data and Poor Model Limits", *IACM ECCOMAS Conference on Computational Science and Engineering,* Lisbon, Portugal, June 3-7 2024.

8. Ghanem, R., Kumar, V., Zeng, X., Gou, Z., "Physics Extraction Probes (PEP) find statistical closure," *ASCE International Conference of the Engineering Mechanics Institute,* Sep 11-13 2024.

9. Hawi, P., Ghanem, R.., "A framework for design allowables accounting for paucity of data and errors in complex models," *ASCE Engineering Mechanics Institute Conference,* Atlanta, GA, June 6-9 2023.

10. Ghanem, R. and Zheming, G., "Mesoscale logic mediates microscale chatter and scientific discovery," *ASCE Engineering Mechanics Institute Conference,* Atlanta, GA, June 6-9 2023.

11. Zeng, X. and Ghanem, R., "Projection Pursuit Adaptation for Polynomial Chaos Expansion," *Eurodyn 2023,* Delft, Netherlands, July 4 2023.

12. Ghanem, R., Zeng, X. and Wang, Z. "Bayes Updating for PCE," *Eurodyn 2023,* Delft, Netherlands, July 4 2023.

13. Ghanem, R. "Model Refinement as Probabilistic Learning," *USACM Thematic Conference on (UQ-MLIP) Uncertainty Quantification for Machine Learning Integrated Physics Modeling,* August 18-19, 2022 Crystal City, Arlington, Virginia.

14. Ghanem, R., "Probabilistic Learning for Optimization¡ *Society of Engineering Science: SES-2023* Texas A&M University, College Station, October 18 2022.

15. Wang, Z., Hawi, P., Aitharaju, V., Mahishi, J., and Ghanem, R., "Model validation and analytical certification of composite material systems", SAMPE, Long Beach, CA, Apr 2023.

16. Zhengtao, Y., Aitharaju, V., Mahishi, J., and Ghanem, R., "Machine learning for the multiscale modeling and analysis of inelastic composites, SAMPE, Long Beach, CA, Apr 2023.

17. Ghanem, R., Soize, C., Aitharaju, V., and Mehrez, L., "Proabilistic learning on manifolds for prognosis and characterization of the digital twin," *USACM Thematic Conference: Mechanicstic Machine Learning and Digital Twins for Computational Science, Engineering, and Technology,* September 26-29 2021, San Diego, CA.

18. Safta, C., Kelli McCoy, Mike Grant, Mike Sparapany, Habib Najm, and Ghanem, R., "Probabilistic learning for trajectory generation," *Sandia Autonomy for Hypersonics Virtual Field Day,* July 28-29, 2021.

19. Wang, Z. and Ghanem, R., "Hierarchical modeling for uncertainty quantification," *16th USNCCM,* Chicago, IL (online), July 26-29, 2021.

20. Zeng, X., Geraci, G., Eldred, M., Jakeman, J., Gorodetsky, A., and Ghanem, R., "Adaptive basis for multifidelity uncertainty quantification," *16th USNCCM,* Chicago, IL (online), July 26-29, 2021.

21. McCoy, K., Safta, C. and Ghanem, R., "Manifold-based optimization for constrained trajectories," *16th USNCCM,* Chicago, IL (online), July 26-29, 2021.

22. Ezvan, O., Zeng, X., Ghanem, R. and Gencturk, B., "Uncertainty quantification in the vibration analysis of spent nuclear fuel container with modal density," *16th USNCCM,* Chicago, IL (online), July 26-29, 2021.

23. A. J. Mannucci, C. Wang, R. Ghanem, A. Surjalal Sharma, Verkhoglyadova, Meng, Vergados, Komjathy, Hajj, "Perspectives on a Community Initiative in Space Weather: Developing Predictive Skill in a Challenging Domain," *101st Annual Meeting of the American Meteorological Society Conference,* January 10-15 2021 (virtual meeting).

24. Ghanem, R., "Uncertainty budgets for credible science can be computed," *AGU Annual Meeting,* December 2020.

25. Zhang, R., Rose, K., and Ghanem, R., "Machine learning for the assessment of socio-economic impacts of geophysical hazards," *AGU Annual Meeting,* December 2020.

26. Ghanem, R. and Soize, C., "Probabilistic Learning on Manifolds," *Machine Learning in Science & Engineering, Columbia University Data Science Institute,* New York, NY, December 15 2020

27. Zeng, X., Geraci, G., Gorodetsky, A., Eldred, M., Jakeman, J., and Ghanem, R., "Uncertainty quantification with multifidelity strategies based on models with dissimilar parameterizations," *WCCM-ECCOMAS, Paris, France,* January 11-15, 2020.

28. Ghanem, R., Safta, C., and Huang, K., "Probabilistic learning for trajectory generation," *Sandia Autonomy for Hypersonics Virtual Field Day,* August 4 2020.

29. Ghanem, R., "Multi-fidelity pooling on manifolds" *15th U.S. National Congress on Computational Mechanics,* Austin, TX, July 28-Aug 1, 2019.

30. Ezvan, O., Zheng X., Ghanem, R., and Gencturk, B., "Robust and high-fidelity reduced-order model for structural vibration analysis of multiscale spent nuclear fuel containers," *15th U.S. National Congress on Computational Mechanics,* Austin, TX, July 28-Aug 1, 2019.

31. Ezvan, O., Zheng X., Ghanem, R., and Gencturk, B., "Robust and high-fidelity reduced-order model for structural vibration analysis of multiscale spent nuclear fuel containers," *15th U.S. National Congress on Computational Mechanics,* Austin, TX, July 28-Aug 1, 2019.

32. Zhang, R. and Ghanem, R., "Efficient probabilistic learning on manifolds: Application to oil spills," *2019 Engineering Mechanics Institute Conference,* Caltech, Pasadena, CA, June 3-6 2019.

33. Wang, Z. and Ghanem, R., "Stochastic sensitivities across scales and physics," *2019 Engineering Mechanics Institute Conference,* Caltech, Pasadena, CA, June 3-6 2019.

34. Zheng X., Ezvan, O., Gencturk, B. and Ghanem, R., " Multiscale dynamic reduction for spent nuclear fuel systems," *2019 Engineering Mechanics Institute Conference,* Caltech, Pasadena, CA, June 3-6 2019.

35. Ghanem, R., Mehrez, L., Ghauch, Z., Aitharaju, V., Rodgers, W. Pasupuleti, P., and Dereims, A., Pasupuleti, P., Dereims, A., McAuliffe, C., Crouch, R., and Fish, J., "Stochastic ICME of Composites," *World Congress on Computational Mechanics,* NYC, NY, July 23 2018.

36. Ghanem, R., Mehrez, L., Ghauch, Z., Aitharaju, V., Rodgers, W. Pasupuleti, P., and Dereims, A.,"Probabilistic Learning and Sampling for Integrated Manufacturing and Performance of Composites," *World Congress on Computational Mechanics,* NYC, NY, July 23 2018.

37. Ghanem, R. and Soize, C., "Probabilistic Learning for Efficient Optimization Under Risk Constraints," *SIAM Annual Conference,* Portland, OR, July 2018.

38. Ghanem, R., Mehrez, L., Ghauch, Z., Aitharaju, V., Rodgers, W. Pasupuleti, P., and Dereims, A.,"Polynomial Chaos for Multiscale Characterization of Material Response and Failure under Uncertainty," *SIAM Conference on Mathematical Aspects of Material Science,* Portland, OR, July 2018.

39. Mehrez, L. and Ghanem, R., "Stochastic modeling of multiscale materials," *2018 SIAM Conference on Uncertainty Quantification,* April 16-19, 2018, Annaheim, CA.

40. Ghanem, R. and Soize, R., "Probabilistic models and sampling on manifolds," *2018 SIAM Conference on Uncertainty Quantification,* April 16-19, 2018, Annaheim, CA.

41. Ghanem, R. and Soize, C., "Manifold sampling for data-driven UQ and optimization," *USNCCM-14,* Montreal, Canada, July 17 2016.

42. Ghanem, R., Mehrez, L., Aitharaju, V., Rodgers, W. "Polynomial Chaos for Multiscale Characterization of Material Response and Failure under Uncertainty," *USNCCM-14,* Montreal, Canada, July 17 2016.

43. Ghanem, R. "Recent advances in probabilistic modeling for multiscale and multiphysics problems," *(JMM) Joint Mathematics Meeting,* Atlanta, GA, Jan 4-7 2017.

44. Ghanem, R., Mehrez, L., Thimmisetty, C., Aitharaju, V., Rodgers, W., Fish, J. "Stochastic methods for upscaling material properties and behavior with application to composites," *Society of Engineering Science (SES) Conference,* College Park, MD October 5, 2016.

45. Jianyu, L. and Ghanem, R., "Numerical solution method for stochastic variational inequalities with polynomial chaos decompositions," *19th European Conference on Mathematics for Industry,* June 16, 2016, Santiago de Compostela, Spain.

46. Li, J. and Ghanem, R., "Stochastic variational inequalities with polynomial chaos," *The 8th International Congress on Industrial and Applied Mathematics,* Beijing, China, August 10-14 2015.

47. Li, J. and Ghanem, R.. "Two Approaches for Solving Stochastic Variational Inequality Problems in the Framework of Polynomial Chaos Expansions," *13th US National Congress on Computational Mechanics,* LaJolla, CA, July 26-30 2015.

48. Ghanem, R., Tipireddy, R., Chowdhary, K., and Najm, H., "QoI basis adaptation," *SIAM Conference on Computational Science and Engineering,* Salt Lake City, March 17 2015.

49. Ghanem, R. and Tipireddy, R. "Stochastic model reduction and multiscale modeling with uncertainty," *WCCM XI: World Congress on Computational Mechanics,* Barcelona, Spain, July 23 2014.

50. Ghanem, R. and Meidani, H., "Uncertainty Quantification and Decisions for Markovian Dynamics," *SIAM Conference on Applications of Dynamical Systems,* Snowbird, UT, March 21 2013.

51. Kalligiannaki, E. and Ghanem, R., "Projections on positive random variables in finite Wiener chaos spaces," *SIAM CS&E Conference,*, Boston, MA, February 25-March 1, 2013.

52. Tipireddy, R. and Ghanem, R., "Stochastic reduced models," *SIAM CS&E Conference,*, Boston, MA, February 25-March 1, 2013.

53. Ghanem, R. and Tipireddy, R., "Dimension reduction for the random eigenvalue problem," *Advances in Computational Mechanics (ACM 2013),* San Diego, CA, February 24-27 2013.

54. Meidani, H., and Ghanem, R., "Diffusion on Random Manifolds," *2012 SIAM International Conference on Data Mining,* Anaheim, CA, April 26-28.

55. Das,S., Spall, J. and Ghanem, R. "Efficient Monte Carlo computation of Fisher information matrix using prior information," *2012 SIAM International Conference on Data Mining,* Anaheim, CA, April 26-28.

56. Meidani, H. and Ghanem, R., "Maximum entropy construction for data-driven analysis of diffusion on random manifolds," *SIAM First Conference on Uncertainty Quantification,* Raleigh, NC, April 2-5, 2012.

57. Arnst, M., Ghanem, R., Phipps, M., and Red-Horse, J., "Dimension reduction and measure transformation in stochastic multiphysics modeling," *SIAM First Conference on Uncertainty Quantification,* Raleigh, NC, April 2-5, 2012.

58. Noshadravan, A., Ghanem, R., Guilleminot, J., Atodaria, I., and Peralta, P., "Validation of a random matrix model for mesoscale elastic description of materials with microstructures," *SIAM First Conference on Uncertainty Quantification,* Raleigh, NC, April 2-5, 2012.

59. Sousedik, B., Ghanem, R., and Phipps, E., "Hierarchical Schur complement preconditioner for the stochastic Galerkin finite element methods," *SIAM First Conference on Uncertainty Quantification,* Raleigh, NC, April 2-5, 2012.

60. Phipps, E., Arnst, M., Constantine, P., Ghanem, R., Red-Horse, J., and Wildey, T., "Stochastic Dimension Reduction Techniques for Uncertainty Quantification of Multiphysics Systems," *SIAM First Conference on Uncertainty Quantification,* Raleigh, NC, April 2-5, 2012.

61. Ghanem, R. and Tipireddy, R., "Stochastic basis reduction via QoI adaptation," *SIAM First Conference on Uncertainty Quantification,* Raleigh, NC, April 2-5, 2012.

62. Meidani, H. and Ghanem, R. "Markov Chains with random transition matrices - a maximum entropy formalism," *11th US National Congress on Computational Mechanics,* Minneapolis, MN, July 2011.

63. Keshavarzzadeh, V. and Ghanem, R., "Convergence acceleration via sequence transformation for the solution of stochastic Galerkin equations," *11th US National Congress on Computational Mechanics,* Minneapolis, MN, July 2011.

64. Noshadravan, A., Ghanem, R., Guilleminot, R. and Peralta, P., "Validation of a probabilistic model for mesoscale elasticity tensor of random polycrystals," *11th US National Congress on Computational Mechanics,* Minneapolis, MN, July 2011.

65. Meidani, H. and Ghanem, R. "Algorithms for stochastic eigenvalue analysis with Polynomial Chaos," *Sixth M.I.T. Conference on Computational Fluid and Solid Mechanics, Cambridge, MA.* June 15-17, 2011.

66. Comboul M. and Ghanem R., "Multiscale modeling for stochastic forest dynamics," *SIAM conference on Applications of Dynamical System,* Snowbird, UT, May 2011.

67. Ghanem, R. and Meidani, H. "MaxEnt Formulation for Markov Chains in Random Environment," *SIAM Conference on Computational Science & Engineering,* Reno, NV, February 28-March 4, 2011.

68. Comboul, M. and Ghanem, R. "Multiscale modeling for stochastic forest dynamics," *SIAM Conference on Computational Science & Engineering,* Reno, NV, February 28-March 4, 2011.

69. Noshadravan, A., Ghanem, R., Guilleminot, R. and Peralta, P., "A validation methodology for a mesoscale probabilistic model of materials with microstructures," *Conference of Engineering Mechanics Institute (EMI 2011),* Northeastern University, Boston, MA, June 2011.

70. Arnst, M. and Ghanem, R., "Stochastic analysis of coupled dynamical systems," *ASCE Engineering Mechanics Institute Conference,* Los Angeles, CA, Aug 8-11, 2010.

71. Noshadravan, A. and Ghanem, R., "Wave propagation in random polycrystals ," *ASCE Engineering Mechanics Institute Conference,* Los Angeles, CA, Aug 8-11, 2010.

72. Phipps, E., Eldred, M., Ghanem, R., Pawlowski, R., Red-Horse, J., Schmidt, R., and Stripling, H., "Stochastic Dimension Reduction for Network Coupled Systems," *AN10: SIAM Annual Meeting,* Pittsburgh, PA, June 12-16, 2010.

73. Noshadravan, A. and Ghanem, R., "Wave propagation in random polycrystals," *AN10: SIAM Annual Meeting,* Pittsburgh, PA, June 12-16, 2010.

74. Ghanem, R. and Arnst, M., "An assessment of stochastic model reduction methods," *European Conference on Computational Mechanics,* Paris, France, May 16-21, 2010.

75. Arnst, M. and Ghanem, R., "Formulation and solution of stochastic variational inequalities describing inelastic material behavior and contact/impact," *10th US National Congress on Computational Mechanics,* Columbus, OH, July 16-19, 2009.

76. Tipireddy, R., Ghanem, R., Das, S., Ghosh, S., and Valiveti, D., "Statistical micrograph synthesis using a parametric texture model and density based Monte Carlo filter," *10th US National Congress on Computational Mechanics,* Columbus, OH, July 16-19, 2009.

77. Meidani, H., Ghanem, R., and Arnst, M., "Computation of Network Equilibrium Using Variational Inequalities" *10th US National Congress on Computational Mechanics,* Columbus, OH, July 16-19, 2009.

78. Das, S.. and Ghanem, S., "Some aspects of stochastic modeling from a nonparametric perspective", *10th US National Congress on Computational Mechanics,* Columbus, OH, July 16-19, 2009.

79. Comboul, M. and Ghanem, R., "Multiscale modeling for stochastic forest dynamics," *10th US National Congress on Computational Mechanics,* Columbus, OH, July 16-19, 2009.

80. Noshadravan, A., Arnst, M., and Ghanem, R., "Computationally efficient representation of stochastic Green's function in randomly heterogeneous media by functional perturbation application to material characterization," *10th US National Congress on Computational Mechanics,* Columbus, OH, July, 16-19, 2009.

81. Comboul M. and Ghanem R., "Analysis of the value of information in the design of resilient water distribution networks," *6th International Conference on Urban Earthquake Engineering (CUEE),* Tokyo, Japan, March 3-4 2009.

82. Red-Horse, J. and Ghanem, R., "Representation of vector-valued random variables," *SIAM Annual Meeting,* San Diego, July 8-10, 2008.

83. Ghanem, R. and Red-Horse, J., "Representation of vector-valued random variables," *9th World Congress on Computational Mechanics,* Venice, Italy, June 29-July 5th, 2008.

84. Doostan, A. and Ghanem, R., "Model Reduction and Adaptation in Stochastic Galerkin Projections," *SIAM Conference on Computational Science and Engineering, CSE'07*, San Diego, February 22nd, 2007.

85. Das, S. and Ghanem, R. "Modeling spatio-temporal random field from experimental measurements," 9^{th} *US National Congress on Computational Mechanics,* July 22-16, 2007, San Francisco, CA.

86. Ghanem, R. and Red-Horse, J. "Model validation as a problem in approximation theory," 9^{th} *US National Congress on Computational Mechanics,* July 22-16, 2007, San Francisco, CA.

87. Chen, J., Ghanem, R. and Li, J. "Partition of probability-assigned parametric space in probability density evolution analysis," 9^{th} *US National Congress on Computational Mechanics,* July 22-16, 2007, San Francisco, CA.

88. Long, K. and Ghanem, R. and Saad, G., "Efficient software for spectral uncertainty analysis in PDE-based models," 9^{th} *US National Congress on Computational Mechanics,* July 22-16, 2007, San Francisco, CA.

89. Shi, J. and Ghanem, R. "Stochastic FEM toolkit for the analysis of large-scale nonlinear systems with parametric uncertainties," 7^{th} *World Congress on Computational Mechanics,* July 16-22, 2006, Los Angeles, CA.

90. Zou, Y. and Ghanem, R. "Multiscale Data Assimilation on 2D boundary fluxes of biological aerosols," 7^{th} *World Congress on Computational Mechanics,* July 16-22, 2006, Los Angeles, CA.

91. Saad, G. and Ghanem, R. "Integration of the polynomial chaos representations with the Ensemble kalman filter," 7^{th} *World Congress on Computational Mechanics,* July 16-22, 2006, Los Angeles, CA.

92. Das, S. and Ghanem, R. "Asymptotic sampling distribution for polynomial chaos representation of data: A maximum entropy and Fisher information approach," 7^{th} *World Congress on Computational Mechanics,* July 16-22, 2006, Los Angeles, CA.

93. Doostan, A. and Ghanem, R. "Model reduction in stochastic Galerkin schemes," 7^{th} *World Congress on Computational Mechanics,* July 16-22, 2006, Los Angeles, CA.

94. Doostan, A. and Ghanem, R. "On the representation of epistemic and aleatoric uncertainty for validation of predictive models," 7^{th} *World Congress on Computational Mechanics,* July 16-22, 2006, Los Angeles, CA.

95. Sarkar, A., Bennabou, N. and Ghanem, R. "Domain decomposition of stochastic systems," 7^{th} *World Congress on Computational Mechanics,* July 16-22, 2006, Los Angeles, CA.

96. Shi, J. and Ghanem, R. "Probabilistic formulation of scale-coupling and uncertainty propagation in GF-based multiscale model," *US National Congress on Theoretical and Applied Mechanics (USNCTAM06),* Boulder CO, June 26-28 2006.

97. Doostan, A. and Ghanem, R. "An A-Posteriori Error Estimate in Stochastic Finite Elements," *SIAM 3rd Conference on Computational Science and Engineering,* Orlando, FL, February 12-15, 2005.

98. Yu, Z., Ghanem, R. and Kevrekidis, Y. "Stochastic data assimilation for multiscale systems," *SIAM 3rd Conference on Computational Science and Engineering,* Orlando, FL, February 12-15, 2005.

99. Red-Horse, J. and Ghanem, R. "New concepts in uncertainty quantification for the validation of predictive models," *SIAM 3rd Conference on Computational Science and Engineering,* Orlando, FL, February 12-15, 2005.

100. Reagan, M., Najm, H., Knio, O., and Ghanem, R. "Uncertainty Quantification in Reacting Flow Contact" *SIAM 3rd Conference on Computational Science and Engineering,* Orlando, FL, February 12-15, 2005.

101. Ghanem, R., "Review of the book: Finite Element Methods with B-Splines by Klaus Hollig," *American Statistical Society,* June 2004.

102. Shi, J. and Ghanem, R. "Nonlocal elasticity for materials with multiscale damage," *Seventh US National Congress on Computational Mechanics,* Albuquerque, NM July 27-30 2003.

103. Red-Horse, J., Paez, T., and Ghanem, R. "The role of uncertainty quantification in the structural dynamics model validation," *Seventh US National Congress on Computational Mechanics,* Albuquerque, NM July 27-30 2003.

104. Ghanem, R. "Error estimation in computational stochastic mechanics," *Seventh US National Congress on Computational Mechanics,* Albuquerque, NM July 27-30 2003.

105. Ghanem, R. and Faverjon, B., "Inverse acoustic scattering in a random environment," *Seventh US National Congress on Computational Mechanics,* Albuquerque, NM July 27-30 2003.

106. Ghanem, R., Abras, J., Wojtkiewicz, S. and Reese, G., "Integration of stochastic finite element capabilities into analysis software," *Seventh US National Congress on Computational Mechanics,* Albuquerque, NM July 27-30 2003.

107. Ghanem, R. "A Computational Framework for the Quantitative Representation and Approximation of Uncertainty," *SIAM 2nd Conference on Computational Science and Engineering,* San Diego, February 10-13, 2003.

108. Knio, O., Maitre, O., Najm, H., Reagan, M., and Ghanem, R. "Stochastic Projection Method for Low-Mach-Number Flow," *SIAM 2nd Conference on Computational Science and Engineering,* San Diego, February 10-13, 2003.

109. Debusschere, B., Najm, H., Knio, O., Ghanem, R., Matta, A., and Le Maitre, O., "Uncertainty Quantification in Electrochemical Microchannel Flow," *SIAM 2nd Conference on Computational Science and Engineering,* San Diego, February 10-13, 2003.

110. Ghanem, R., "Integration of deterministic and stochastic error estimators for a probabilistic-based certification of model-based predictions," *Sixth US National Congress on Computational Mechanics,* Dearborn, Michigan, August 1-4 2001.

111. Ghanem, R., Knio, O., and Najm, H., "Stochastic projection method in microfluidic simulations," *Sixth US National Congress on Computational Mechanics,* Dearborn, Michigan, August 1-4 2001.

112. Ghanem, R., and Sarkar, A., "Polynomial chaos representation of dynamics in the medium-frequency range," *Sixth US National Congress on Computational Mechanics,* Dearborn, Michigan, August 1-4 2001.

113. Ghanem, R., and Romeo, F., "System identification of nonlinear dynamical systems using wavelets" *2001 Mechanics and Materials Conference, Joint ASME-ASCE-SES Conference,* June 27-29 2001, San Diego.

114. Ghanem, R., and Pellissetti, M., "Error estimation in stochastic computational mechanics," *2001 Mechanics and Materials Conference, Joint ASME-ASCE-SES Conference,* June 27-29 2001, San Diego.

115. Ghanem, R., "Characterizing uncertainty propagation in models," *National Research Council Panel on Predictability and Limits of Prediction in Hydrological Sciences,* Boulder, CO, September 21-22, 2000.

116. Ghanem, R. "A theoretical and computational framework for the propagation of uncertainty in complex physical systems," *Third Annual DOE/MICS Workshop, Predictability of Complex Phenomena,* Los Alamos, December 6-8, 1999.

117. Ghanem, R., "Overview of Quantitative Uncertainty Modeling," *Fifth US National Congress on Computational Mechanics,* Boulder, Colorado, August 4-6 1999.

118. Red-Horse, J., and Ghanem, R., "Finite Element Analysis of Large Scale Stochastic Dynamical Systems," *Fifth US National Congress on Computational Mechanics,* Boulder, Colorado, August 4-6 1999.

119. Sakamoto, S., and Ghanem, R., "Computationally Efficient Representation of Non-Gaussian Stochastic Fields," *Fifth US National Congress on Computational Mechanics,* Boulder, Colorado, August 4-6 1999.

120. Ghanem, R., "New Tools for the Analysis of Heterogeneous Materials," *International Conference on Integrity, Reliability, and Failure,* Porto, Portugal, July 19-22, 1999.

121. Ghanem, R. and Francesco, R., "Wavelet Projections for Structural Condition Assessment," *International Conference on Integrity, Reliability, and Failure,* Porto, Portugal, July 19-22, 1999.

122. Ghanem, R., Romeo, F., "Identification of Transients in Material Behavior Using a Wavelet Galerkin Method," $53rd^{rd}$ *Machinery Failure Prevention technology,* Virginia Beach, April 19-23 1999.

123. Ghanem, R., and Zhou, W., "Micromechanical design of adaptive systems: Hydrodynamic and electrostatic interactions in complex fluids," Presented at the 157^{th} *Meeting of the Japanese Society for the Promotion of Science (JSPS),* Tokyo, February 19, 1999.

124. Ghanem R. and Redhorse J., "A Computational Framework for the Propagation of Uncertainty in Physical Systems," *Predictability: Quantifying Uncertainty in Models of Complex Phenomena,* 18^{th} *Annual International Conference,* J.R. Oppenheimer Study Center, Los Alamos National Laboratory, May 11-15, 1998, Los Alamos, New Mexico.

125. Ghanem, R., "Towards a general purpose stochastic finite element implementation," *the 4th US National Congress on Computational Mechanics,* San Francisco, CA, August 6-8 1997.

126. Zhang, R., Ghanem, R., Hayek, B., and Shinozuka, M., "Transposrtation of species within the sea by conditional simulation technique," *the 4th US National Congress on Computational Mechanics,* San Francisco, CA, August 6-8 1997.

127. Ghanem, R., El-Mestkawy, M., and Wang, Z., "Computational models for granular materials: Applications to soil liquefaction and electro-rheological fluids," *International Union for Theoretical and Applied Mechanics (IUTAM) Symposium on the Mechanics of Granular and Porous Materials,* 15-17 July 1996, Cambridge University, Cambridge, UK.

128. Ghanem, R., and El-Mestkawy, M., "Statistical model for sand compaction under cyclic shear strain," *Proceedings of the* 11^{th} *ASCE Specialty Conference on Engineering Mechanics*, Edited by Y.K. Lin and T.C. Su, ASCE, pp. 722, Fort Lauderdale, Fl., May 19-22, 1996, pp. 722.

129. Ghanem, R., "Soil-pile-structure interaction analysis from experimental and field data," invited contribution to the *EUROMECH Colloquium on Methods for Nonlinear Stochastic Structural Dynamics,* Innsbruck, Austria, 13-17 March 1995. (Invited presentation, only a book of abstracts was published.)

130. Torikoshi, K., Itoh, I., Inazuka, T., Hiei, T., Watanabe, T., Ghanem, R., and Shinozuka, M., "Experimental and numerical study of ER damper and its adaptive control method," 2^{nd} *MOVIC*, Japan, 1994.

131. Ghanem, R., "Fundamental solutions for a class of stochastic differential operators," *12th US National Congress of Applied Mechanics,* Seattle, WA, June 1994.

132. Ghanem, R., and Spanos, P., "Simulation of stochastic processes over finite domains," *First Joint ASCE-EMD, ASME-AMD, SES Meeting*, June 6-9, 1993, Charlotsville, Virginia.

133. Ghanem, R., and Brzakala, V., "Nonlinear stochastic finite elements in geotechnical engineering," *First Joint ASCE-EMD, ASME-AMD, SES Meeting, June 6-9, 1993, Charlotsville, Virginia.*

134. Ghanem, R., Shinozuka, M., and Green, M., "Parametric analysis of the effects of spatial variability in hydraulic conductivity on ground-water flow," *CSCE'93 Annual Conference*, Fredericton, Canada July 8-11 1993.

135. Shinozuka, M., Ghanem, R., H. Itoh, and Inazuka, T., "Development of vibration suppression devices using variable dampers," *UJNR Workshop on Smart and High Performance Materials and Structures,* Building Research Institute, Tsukuba, Japan, May 14-15, 1993.

136. Shinozuka, M., Ghanem, R., and Constantinou, M., "Integrated approach to structural control for seismic hazard mitigation," *UJNR, The* 25^{th} *Joint Meeting of United States-Japan Panel on Wind and Seismic Effects,* Tsukuba, Japan, 1993.

137. Shinozuka, M., and Ghanem, R., "Use of variable dampers for earthquake protection of bridges," *Proceedings of the Second US-Japan Workshop on Earthquake Protective Systems for Bridges,* Tsukuba, Japan, December 7-8, 1992.

138. Shinozuka, M., Constantinou, and Ghanem, R., "Passive and active fluid dampers in structural applications," *U.S./China/Japan Workshop on Structural Control,* Shanghai, China, October 1992.

139. Ghanem, R., and Shinozuka, M., "Development of vibration suppression devices using variable dampers," *NCEER Bulletin,* Vol. 6, Number 3, pp.5-8, July 1992.

140. Spanos, P., and Ghanem, R., "Functional expansions in stochastic finite elements," *First U.S. National Congress on Computational Mechanics,* Chicago, Ill., July 21-24, 1991.

141. Ghanem, R., and Spanos, P., "Spectral expansions for nonlinear vibration," *28th Annual Technical meeting of the Society of Engineering Science,* University of Florida, Gainsville, Fl., November 6-8, 1991.

Book Chapters:

1. J Fish, K Matous, R Ghanem, WC Sun, "Predictive Multiscale Paradigm for Computational Design Certification," pages 303-351 in *COmprehensive Mechanics of Materials,* Edited by Francesco Dell'Isola, Anil Misra, Filippo Berto, René de Borst, Raffaele Barretta and Raj Das, Elsevier. (2024).

2. R Zhang, P Wingo, R Duran, K Rose, J Bauer, R Ghanem, "Environmental Economics and Uncertainty: Review and a Machine Learning Outlook," *Oxford Encyclopedia of Environmental Economics,* 2020.

3. Ghanem, R., D. Higdon, and H. Owhadi, "Introduction to Uncertainty Quantification," in *Handbook on Uncertainty Quantification,* Springer, 2017.

4. Ghanem, R. and Red-Horse, J., "Polynomial Chaos: Modeling, Estimation, and Approximation," in *Handbook on Uncertainty Quantification,* Springer, 2017.

5. Das, S. and Ghanem, R., "Stochastic upscaling for inelastic material behavior from limited experimental data," *Computational Methods for Microstructure-Property Relationships,* pp. 443-368, Edited by S. Ghosh and D. Dimiduk, Springer-Verlag, 2010.

6. Ghanem, R., "The Characterization and Management of Uncertainty in Model-based Predictions," pp. 318-332, in *Modeling and Simulation-Based Life Cycle Engineering*, Edited by K. Chong and S. Saigal, Taylor and Francis, 2001.

7. Ghanem, R., "Models for Uncertainty and Its Propagation with Applications to Geomechanics," in *Modeling and Applications in Geomechanics,* Edited by M. Zaman, J. Gioda, and J.R. Booker, Elsevier, 1999.

8. Ghanem, R., and Spanos, P., "A Spectral Formulation of Stochastic Finite Elements," pp. 289-312, in *Probabilistic Methods for Structural Design,* Edited by G. Soares, Kluwer Academic Publishers, Dordrecht, 1997.

Technical Reports:

1. J Jakeman, M Eldred, G Geraci, D Seidl, T Smith, A Gorodetsky, T Pham, Akil Narayan, Xiaoshu Zeng, and Roger Ghanem, *SAND2022-12793 : Multi-fidelity information fusion and resource allocation,* Sandia National Labs, Albuquerque, NM, 2022

2. X Zeng, G Geraci, M Eldred, J Jakeman, A Gorodetsky, and R Ghanem, *SAND2021-8932C: Adaptive Basis for Multifidelity Uncertainty Quantification,* Sandia National Labs, Albuquerque, NM, 2021

3. R Shaffer, L Kocia, P Hawi, R Ghanem, M Sarovar, *SAND2021-6271C : Statistical Learning Techniques for Variational Quantum Algorithms,* Sandia National Lab.(SNL-NM), Albuquerque, NM (United States) 2021

4. X Zeng, G Geraci, MS Eldred, R Ghanem, *SAND2021-2271C : Exploring important directions for multifidelity uncertainty quantification by basis adaptation method,* Sandia National Lab.(SNL-NM), Albuquerque, NM, 2021.

5. NRC Committee on Mathematical Foundations of Verification, Validation, and Uncertainty Quantification "Assessing the Reliability of Complex Models: Mathematical and Statistical Foundations of Verification, Validation, and Uncertainty Quantification," *NRC Board on Mathematical Sciences and Their Applications Division on Engineering and Physical Sciences, 2012.*

6. Ghanem, R. "A Report to NSF on Opportunities and Challenges in Uncertainty Quantification for Complex Interacting Systems," 2010.

7. Najm, H., Reagan, M., Knio, O., Ghanem, R., and LeMaitre, O. "Uncertainty Quantification in Reacting Flow Modelling," *Sandia Report: SAND2003-8598,* 2003.

8. Ghanem, R., *Computer-Aided Design of Electro-Rheological Fluids,* Report to Daikin Corporation, Sakai, Japan, May 1997.

9. Ghanem, R., and Bujakov, M., *Nonlinear Control Techniques for Dynamical Systems with Uncertain Parameters,* National Center for Earthquake Engineering Research, Technical Report No NCEER-96-0007, May 1996.

10. Ghanem, R., *SYSTEM-L : A New Generation Engineering Analysis Software,* Report to Taisei Corporation, Tokyo, Japan, December 1993

11. Ghanem, R., Shinozuka, M., and Gavin, H., *Experimental Verification of a Number of System Identification Algorithms,* NCEER Technical Report 91-0024, 1991.

12. Spanos, P., and Ghanem, R., *Stochastic Finite Element Expansion for Random Media,* NCEER Technical Report 88-0005, March 1988.

INVITED LECTURES

Keynote Addresses:

1. "Probabilistic Machine Learning with Physics," *Third Annual MLSE Conference: Mechanical Engineering, Engineering Mechanics, and Civil Engineering tracks,* Columbia University, NYC, June 1-3 2020.

2. "Probabilistic Modeling for Complex Design and Decisions" *SoCal First Mechanics Symposium,* UCSD, LaJolla, CA, January 18 2020.

3. "Learning to adapt: UQ at extreme scale," *3rd International Conference on Uncertainty Quantification in Computational Sciences and Engineering,* 24-26 June 2019, Crete, Greece.

4. "Physics-Constrained Data Science: Adaptation for Large-Scale Inference" *International Workshop on Data Science in Civil Engineering,* Tongji University, Shanghai, June 8-9, 2019.

5. "Advances in stochastic dynamics: uncertainty, learning, and physics," *The Wei-Qiu Zhu Lecture at the 11th China National Conference on Theory and Application of Random Vibration,* October 12-14, 2018, Yichang, Hubei, China.

6. "Modeling and Algorithmic Aspects of UQ for Material with Multiscale Behavior," *Plenary talk at the SAMSI Workshop on Model Uncertainty: Mathematical and Statistical,* Durham, NC August 22 2018.

7. "Data-driven science: A paradigm for design and optimization," *World Congress on Computational Mechanics,* NYC, NY July 22-27, 2018.

8. "Physics, Structure, and Uncertainty: Probabilistic Learning for Risk Mitigation" *ASCE Engineering Mechanics Institute Conference,* MIT, Boston, MA, May 29-June 2018.

9. "Machine learning for Uncertainty Quantification", *DOE/ASCR Scientific Machine Learning Workshop,* North Bethesda, MD January 30- February 1, 2018.

10. "Uncertainty modeling for materials with multiscale and multiphysics interactions," *ECCOMAS: Computational Modelling of Multi-Uncertainty and Multi-Scale Problems,* Porto, Portugal, September 12-14, 2017.

11. "Uncertainty Quantification for Complex Interacting Systems," 6^{th} *Asian Pacific Symposium on Structural Reliability and its Applications,* Shanghai, China, May 28-30 2016.

12. "Uncertainty Modeling and Quantification for Complex Decisions," (keynote) *First International Conference on the Quantification of Uncertainty in Engineering, Science and Technology (QUEST)*, Beihang University, Beijing, China, October 19-23, 2015.

13. "Risk Assessment for Complex Systems," *ASCE Engineering Mechanics Institute Inaugural International Conference,* Hong-Kong Polytechnic University, January 7-9 2015.

14. "Stochastic Reduced Models," *EURODYN 2014, The Ninth International Conference on Structural Dynamics,* Porto, Portugal, June 30 - July 2 2014.

15. "Stochastic Model Reduction with Basis and Measure Adaptation," *Aachen Conference on Computational Engineering Science,* Aachen, Germany, September 9 2013.

16. "Reduced Predictive Models with Uncertainty Quantification," *Opening Session for ICERM Program on Uncertainty Quantification,* Brown University, Providence, RI, Sep 7 2012.

17. "Model reduction in uncertainty quantification: An interplay between basis and measure adaptation," (semi-plenary) *12th World Congress on Computational Mechanics,* Sao-Paolo, Brazil, July 8-13, 2012.

18. "UQ in Computational Science and Engineering," *Fourth International Conference on Scientific Computing and Partial Differential Equations (SCPDE11),* Hong Kong, China, December 5-9, 2011.

19. "V&V or a Psycho-Analysis of Predictions,", *European Conference on Computational Mechanics,* (semi-plenary) Paris, France, May 16-21, 2010.

20. "Uncertainty Management in Predictive Simulations," *Workshop on Quantification on CFD Uncertainties,* at the Vrije Universiteit Brussel, Belgium, October 29-30, 2009.

21. "Data Assimilation for Updating Parameter and Model Uncertainty," *Inaugural Conference on Computational Methods in Energy and Environmental Research,* Peking University, Beijing, China, July 9-12, 2007.

22. "Polynomial Chaos in Uncertainty Quantification and Management: A Consistent Paradigm for Predictive Science," *AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference,* April 2007, Honolulu, HI.

23. "Predictive Science: A Confluence of Verification, Validation and Uncertainty Quantification," *12th International Symposium on Dynamic Problems of Mechanics,* Feb 26-Mar 2, 2007, Ilhabela, Sao Paolo, Brazil.

24. "Eléments finis stochastiques: Développements récents et mise en œuvre," *Mécanique Probabiliste des Matériaux et des Structures, Commission Scientifique de l'Association Francaise de Mécanique,* Marne-la-Vallée, France, January 9-10, 2006.

25. "Hybrid representations for complex dynamical stochastic systems: coupled non-parametric and parametric models," (semi-plenary) *Sixth European Conference on Structural Dynamics,* Eurodyn 2005, Paris, France, September 4-7, 2005.

26. "Towards a rational integration of uncertainty into model-based predictions," 5^{eme} *Colloque National en Calcul des Structures,* Giens, France, May 15-19 2001.

27. "Uncertainty in Mechanics: Mechanics of Uncertainty," *14th ASCE Engineering Mechanics Conference,* The University of Texas, Austin, May 21-24 2000.

Departmental Seminars

1. "Peeking into a radioactive box," *Distinguished Dynamics Colloquium,* Department of Civil Engineering, Columbia University, April 9 2024.

2. "Peeking into a radioactive box," *Distinguished Dynamics Colloquium,* ETH Zurich, Feb 20 2023.

3. "Overview of recent UQ activities at USC," *FASTMATH,* June 5 2023.

4. "Physics, Structure and Uncertainty," *Google: Scientific Machine Learning @ Google,* May 5, 2022.

5. "Chasing the tail: Adaptations in Uncertainty Quantification," *Google: Scientific Machine Learning @ Google,* May 19, 2022.

6. "Physics, Structure, and Uncertainty: Probabilistic Learning for Risk Mitigation," *Department of Aerospace and Mechanical Engineeering, Notre Dame University, February 15 2022*

7. "Physics, Structure, and Uncertainty: Probabilistic Learning for Risk Mitigation," *Department of Civil Engineeering, Yichang University, China, April 6 2022*

8. "Physics, Structure and Uncertainty", *Department of Civil Engineering, Johns Hopkins University,* April 1 2021.

9. "Physics-Informed Probabilistic Learning," *Department of Industrial and Systems Engineering,* USC, March 30 2021.

10. "Back of the envelope calculations on supercomputers," *Jet Propulsion Laboratory,* Pasadena, CA, July 24 2020.

11. "Advances in High Performance Uncertainty Quantification," *Google Inc.,* February 4 2019.

12. "Design Optimization under Uncertainty in Large Scale Computational Models," *SpaceX,* Torrance, CA Nov 14 2018.

13. "Adapted stochastic inference for large scale computational models," *GE Global Research Center,* Niskayuna, NY, May 29 2018.

14. "Advances in Stochastic Model Reduction," *Workshop Honoring the contributions of Carlos Felippa and KC Park to the field of multi-physics modeling University of Colorado, Boulder,* April 23-24, 2018.

15. "Statistical Sampling on Manifolds for Expensive Computational Models," *Plenary talk at CDSE Days*, SUNY, Buffalo, NY, April 9-13 2018.

16. "Multiscale probabilistic models for manufacturing, performance and failure of composites," *Iffstar,* Cité Descartes, Marne-la-Vallée, France, December 20 2017.

17. "Data-Driven Prediction and Optimization of Complex Systems," *ENSTA,* Paris, France, December 19 2017.

18. "Probabilistic models for inference and design in complicated problems," *ICES,* The University of Texas at Austin, April 27 2017.

19. "Uncertainty quantification at the interface of computing and everything else" *AMS/ME Colloquium,* Colorado School of Mines, January 13 2017.

20. "Probabilistic methods for dealing with expensive computational models," *Atmospheric, Earth and Energy Division, Lawrence Livermore National Laboratory,* December, 5 2016.

21. "Basis Adaptation with Gaussian Isometries," *CSRI, Sandia National Laboratories,* Albuquerque, NM, August 2-3, 2016.

22. "Uncertainty Quantification in the Age of High Fidelity Sensors, Multiscale Models, and High-Performance Computing," *Department of Mathematics, Shanghai Normal University,* June 3, 2016.

23. "Probabilistic Models for Inference and Design in Complicated Problems," *Department of Civil & Environmental Engineering, University of Illinois*, Urbana-Champaign, IL, April 25 2016.

24. "Probabilistic Models for Worth of Information," *The Wenyuan Forum Lecture, Tongji University,* Shanghai, China, May 7 2015.

25. "Introduction to Polynomial Chaos Representations for Uncertainty Quantification and Management," *National Energy Technology Laboratory,* Albany, OR, August 19 2014.

26. "Uncertainty Quantification in Systems with Coupled Physics," *Computational and Applied Math Seminar, Arizona State University,* Tempe, AZ, February 19 2014.

27. "Recent Developments in Polynomial Chaos Formalism to UQ," *Department of Civil and Environmental Engineering, Vanderbilt University,* Nashville, TN, February 10, 2014.

28. "Hierarchical Interpolation for Risk Assessment in Reservoir Evaluation," *EXPEC-ARC Group, ARAMC O,* Dhahran, Kingdom of Saudi Arabia, January 11 2014.

29. "New Class of Reduced Models in Uncertainty Quantification," *LaMCoS: Laboratoire de la Mecanique des Contacts et des Structures - INSA de Lyon, France* December 10 2013.

30. "Polynomial Chaos Decompositions for Uncertainty Characterization and Management" *Business Analytics and Mathematical Sciences Department,* IBM T J Watson Research Center, Yorktown Heights, NY, June 18 2013.

31. "Uncertainty Quantification at the Intersection of Engineering, Science and Technology," *Department of Civil Engineering and Engineering Mechanics,* Columbia University, NYC, May 30 2013.

32. "Model Reduction for the Characterization and Analysis of Complex Systems," *Department of Civil Engineering,* Duke University, Durham, NC, February 11 2013.

33. "Model Reduction in the Mechanics of Random Media," *Department of Civil Engineering,* The University of Texas at Austin, December 5 2012.

34. "Stochastic representations of model-based predictions and associated data assimilation," *Institute for Computational Engineering and Science (ICES),* The University of Texas at Austin, September 13 2012.

35. "Upscaling and Dimension Reduction for Stochastic Flows," *Department of Mechanical and Aerospace Engineering,* UCSD, October 29 2012.

36. "A Perspective on Uncertainty Quantification and Model Validation," *Princeton University*, April 9 2012.

37. "V&V or the Schizophrenia of Prediction Science: from Diagnosis to Therapy ," *MIT Distinguished Speaker Series in Computational Science and Engineering,* Cambridge, March 7 2012.

38. "V&V in Predictive Models," *Department of Atmospheric, Oceanic and Space Sciences, University of Michigan*, Ann Arbor, April 7 2011.

39. "A Computable Approach to Validation" *Frontiers in Computational & Information Sciences Seminar Series,* Pacific Northwest National Laboratory, Richland, WA, August 16 2010.

40. "V&V or Investigation on the Multiple Personalities of Predictions," *ICeS: Institute for Computational Engineering and Science,* University of Texas, Austin, March 27-April 1, 2010.

41. "V&V or a Psychology of Models," *Department of Mathematics, University of California, Berkeley, March 4, 2010.*

42. "Back of the Envelope Calculations: When and How Big ?" Institute for Computational and Mathematical Engineering, Stanford University, November 16 2009.

43. "Verification and Validation: A Paradigm for Trustworthy Predictions," *CAMS Colloquium,* USC, October 19, 2009.

44. "An Approximation Theory for Model Validation," University of California Santa Barbara, CA, January 16 2009.

45. "Mathematical Formulation for the Validation Problem," Lawrence Livermore National Laboratory, Livermore, CA, December 17, 2008.

46. "Model Construction and Model Validation with Polynomial Chaos Expansions," *Technical University of Munich and Siemens AG,* July 3rd 2008.

47. "Stochastic Predictive Methods," Wright Patterson Air Force Base, Materials Directorate, April 30 2008.

48. "Data Assimilation for Prediction of Multiphase Flow in Random Porous Media," Department of Mechanical Engineering, University of California, Berkeley, April 23 ,2008.

49. "Prediction and Validation in Multiscale Mechanics," Department of Civil and Environmental Engineering, University of Minnesota, March 28, 2008.

50. "Probabilistic Methods in Component Life Asssessment," Bettis Nuclear Power Laboratory, Pittsburgh, PA, March 6 2008.

51. "Validation and Prediction in Multiscale Mechanics," Department of Mechanical Engineering, Northwestern University, Nov 8, 2007.

52. "Uncertainty quantification and management in prediction science," Department of Energy Resources Engineering, Stanford University, Oct 9, 2007.

53. "Stochastic methods in computational mechanics," presentation at MSC-NASTRAN, Santa Ana, CA, March 5th 2007.

54. "Uncertainty Quantification, Model Validation, and Prediction Science," Department of Civil and Mechanical Engineering, University of California, Irvine, February 8 2007.

55. "Research in Structural Health Monitoring and Prediction at USC," Department of Building Engineering, Tongji University, Shanghai, China, January 16, 2007.

56. "Elements of Prediction Science and Uncertainty Quantification," Department of Aerospace and Mechanical Engineering, Ohio State University, January 12 2007.

57. "A Review of Uncertainty Quantification and Prediction Science," Department of Civil and Mechanical Engineering, University of California, Los Angeles, November 7th, 2006.

58. "UQ and V&V aspects of the proposed Center for Materials Integrity in Satellite Microsystems," *Sandia National Laboratories, Albuquerque, NM* September 7 2006.

59. "Recent Development in Stochastic Predictions and Model Validation," ONERA, Paris, France, May 9th 2006.

60. "Vistas in Computational Stochastic Mechanics," Department of Mechanical Engineering, University of California, Berkeley, October 25, 2004.

61. "Orthogonal Expansions For Stochastic Systems: Applications to Uncertainty Quantification and Management," Department of Systems Engineering & Operations Research, George Mason University, November 2004.

62. "Essential Ingredients for Quantificable Predictions: The Case for Uncertainty Quantification and Management," AFOSR, Arlington, VA, September 20, 2004.

63. "Stochastic Parameterization and Extensions," ANSYS Inc., Pittsburgh, PA, August 16 2004.

64. "Stochastic Computing," Pacific Northwest National Laboratory, Richland, WA, June 10, 2004.

65. "Ingredients in Validated Predictive Modeling," Department of Mechanical Engineering, University of Southern California, April 26 2004.

66. "Uncertainty Quantification and Management: New Frontier in Scientific Computing," Department of Civil Engineering, Caltech, March 29 2004.

67. "Computational Stochastic Mechanics : New Frontier in Scientific Computing," Department of Civil Engineering, University of Southern California, March 12 2004.

68. "Multiscale and Stochastic Modeling in Mechanics," Department of Civil Engineering and Geological Sciences, University of Notre Dame, March 16 2004.

69. "Perspectives on Computational Stochastic Mechanics," Distinguished Lecture Series, Scientific Computing and Imaging Institute, Department of Computer Science, University of Utah, Salt Lake City, Utah, February 20, 2004.

70. "Error Budgets for the Validation of Predictive Models," Linbeck Distinguished Lecture, Department of Civil Engineering and Geological Sciences, University of Notre Dame, October 31 2003.

71. "Nonlocal Modeling of Materials with Random Microstructure," Séminaire Descartes, École Normales des Ponts et Chaussées, France, January 15 2004.

72. "Error budgets for the validation of predictive models," University of California, Irvine, April 11, 2003.

73. "Error budgets for the validation of complex predictive models," Columbia University, March 20, 2003.

74. "A Theoretical Framework for the Analysis and Refinement of Uncertain Systems," Séminaire Descartes, École Normales des Ponts et Chaussées, France, January 9 2003.

75. "Some Recent Advances in Computational Stochastic Mechanics," Center for Aerospace Structures Seminar, The University of Colorado, Boulder, CO, October 14, 2002.

76. "Computational Aspects in the Representation, Propagation, and Management of Uncertainty in Model-Based Predictions," Mechanical, Aerospace, and Nuclear Engineering Colloquium, Rensselaer Polytechnic Institute, Troy, NY October 1, 2002.

77. "Propagation and Management of Uncertainty in Mechanics-Based Models," Department of Mechanical and Aerospace Engineering, Arizona State University, Phoenix, AZ, October 9 2001.

78. "Characterization and Computation of the State of Stochastic Systems," Department of Mathematics, Colorado University in Denver, February 26, 2001.

79. "Research in Stochastic Mechanics at Johns Hopkins University," École Central de Paris, October 26, 2000.

80. "Propagation and Management of Uncertainty in Mechanics-Based Models," Brown University, Division of Applied Mathematics, October 5, 2000.

81. "Mechanics of Uncertainty," École Centrale de Paris. November 25 1999.

82. "The Formulation of a General Purpose Stochastic Finite Element Method," Texas A&M University, Fall 1997.

83. "Theoretical Foundation of the Stochastic Finite Element Method,", Texas Institute for Computational and Applied Mechanics (TICAM) at the University of Texas, Austin, Fall 1997.

84. "System Identification using Wavelet Approximations of Dynamical Systems," Rice University, Fall 1997.

85. "Recent Developments in Non-Deterministic Computational Mechanics," Sandia laboratories, December 1996.

86. "Recent Developments in Stochastic Finite Elements," Columbia University, October 22, 1996.

87. "Developments in Computational Stochastic Mechanics," Brooklyn Polytechnic Institute, March 16, 1996.

Short Courses

1. "Probabilistic Modeling in Geosciences," (3 hours) *SIAM Conference on Geosciences,* March 11-14, 2019, Houston, TX.

2. "Introduction to Polynomial Chaos Models," (3 hours) *UQ Summer School,* University of Southern California, Los Angeles, CA August 8-10, 2018.

3. "Short Course on UQ," (4 hours) *Tongji University,* Shanghai, China, May 13-14 2015.

4. "Uncertainty Quantification," (40 hours) *ARAMCO Research,* Dhahran, Saudi Arabia, February 1-5 2015.

5. "Stochastic Representations," (3 hours) *UQ Summer School,* University of Southern California, Los Angeles, CA August 22-24, 2012.

6. "Stochastic Computational Science," (6 hours) *SIAM Conference on Uncertainty Quantification,* Rayleigh, NC, April 1 2012.

7. "Stochastic Representations of Model-Based Predictions and Associated Data Assimilation," (6 hours) *CIMPA UNESCO School in Applied Mathematics,* KAUST, Saudi Arabia, Spring 2012.

8. "Uncertainty Quantification in Geosciences," (2 hours) *SIAM Conference on Geosciences,* Long Beach, California, March 21-24, 2011.

9. "Uncertainty Quantification in Mechanics: Theoretical and Computational Aspects," (6 hours) *10^{th} US National Congress on Computational Mechanics* (with C. Soize), San Francisco, CA, July 22nd, 2007, and the *10^{th} USNCM* in Columbus, OH, July 15, 2009, and the *11^{th} USNCM* in Minneapolis, MN, July 24, 2011.

10. "Stochastic Finite Elements," (6 hours) *UNICAMP,* Campanis, Brazil, March 2nd 2007.

11. "Uncertainty Quantification," (6 hours) *SIAM* 2^{nd} *Conference on Computational Science and Engineering*, San Diego, February 9th 2003.

12. "Quantification of Confidence in Model-Based predictions," (6 hours) *Wright Patterson Air Force Base,* Dayton, OH, September 2001.

Workshops

1. "Physics Extraction Pods (PEP)," *Second USACM Thematic Conference on Uncertainty Quantification for Machine Learning Integrated Physics Modeling (UQ-MLIP 2024)* August 12-14, 2024, Crystal City, Arlington, Virginia, USA

2. "Introduction to Uncertainty Quantification," *DATAWorks 2024 Defense and Aerospace Test and Analysis Workshop,* April 16-18, 2024, Alexandria, VA.

3. "Recent developments in uncertainty quantification and model validation for complex systems," *New York Scientific Data Summit 2024: Addressing Data Challenges in Digital Twins,* Brookhaven National Laboratory in the City, NYC, September 16–17, 2024.

4. "Lessons from high speed reacting flows," *CIRM Workshop on Digital Twins for Planet Earth,* Marseille, France, July 22-26 2024.

5. "Modeling Extremes of Powergrid Generation with PLoM," *USACM Energy & Earth Systems Webinar,* May 13 2024.

6. PCE (a 4 hour tutorial) *INI Workshop: Introduction to Uncertainty Quantification in Mechanics of Materials* Isaac Newton Institute, Cambridge University, 10-14 July 2023

7. "Leveraging Structure in Data Assimilation," *DDEW03 : Computational Challenges and Emerging Tools for Digital Twins,* Isaac Newton Institute, Cambridge, April 27 2023.

8. "Data Assimilation and Uncertainty Quantification," *2023 MACCCR Annual Energy, Fuel and Combustion Research Review*, March 3 2023, Sandia/CRF, Livermore, CA.

9. "Hierarchy and intrinsic structure for a more credible validation," *Institute for Mathematical and Statistical Innovation: Workshop on Verification, Validation, and Uncertainty Quantification Across Disciplines,* Online, May 14 2021.

10. "Prediction and adaptation as constrained statistical inference," *The Center for Advanced Mathematics for Energy Research Applications (LBNL): Workshop on Autonomous Discovery in Science and Engineering,* Online, April 20 2021.

11. "Stochastic Reduced Models: L_2 projections and L_1 approximations," invited talk at the *ICERM Workshop on Algorithms for Dimension and Complexity Reduction,* March 25 2020.

12. "Probabilistic frameworks for multiscale simulations of brittle failure," invited talk at *Workshop on Mathematics Challenges Associated with Failure of Brittle Materials*, Johns Hopkins University, Baltimore, MD 20-21, 2019.

13. "Probabilistic Learning in Scientific Computing", *International Workshop on Data-Centric Engineering,* MIT Cambridge, MA, Dec 9-12 2019 (https://www.dceworkshop.org)

14. "Risk and Computational Science", *NSF Computational Mechanics Vision Workshop,* University of Michigan, Ann Arbor, MI October 31-Nov 2 2019. (https://micde.umich.edu/nsf-compmech-workshop-2019/agenda/)

15. "Stochastic Simulations," *ARO Workshop Mathematical Challenges Associated with Failure of Brittle Materials,* Johns Hopkins University, Maryland, May 20-21 2019.

16. "Probabilistic learning for prediction and optimization of complex systems," *Workshop at the Interface of Scientific Machine Learning and UQ,* USC, Los Angeles, CA June 4-6, 2018.

17. "Multiscale probabilistic models for manufacturing, performance and failure of composites" *Workshop on Uncertainty Quantification for Stochastic Systems and Applications,* IPAM, UCLA, Los Angeles, November 13-17, 2017.

18. "Uncertainty modeling for optimization," *EPTEK: Excellence in Education and Research: An Adaptive and Integrative Approach for E&P,* Oct. 15-17, 2017, College of Petroleum Engineering & Geosciences, KFUPM Dhahran, Kingdom of Saudi Arabia.

19. "Data-Driven Sampling and Prediction on Manifolds," *USACM Workshop on Uncertainty Quantification and Data-Driven Modeling,* Austin, TX, March 23-24, 2017.

20. "Stochastic Modeling for Performance and Design Across Scales," *IUTAM Symposium on Materials under Extremes* June 20-22, 2016.

21. "Reliability in the Age of High Fidelity Sensors, Multiscale Models, and High-Performance Computing," *International Workshop on Engineering Reliability and Stochastic Mechanics (IWERSM 2016)*, Tongji University, Shanghai, June 1st 2016.

22. "Multiscale modeling in support of product design," *IMA Special Workshop on Optimization and Uncertainty Quantification in Energy and Industrial Applications,* Institute of Mathematics and Its Applications, February 22-24, 2016, University of Minnesota, Minneapolis, MN.

23. "Probabilistic Treatment of Multiscale Problems," *Workshop on Uncertainty Quantification in Multiscale Problems,* IPAM, UCLA, Los Angeles, January 19-22, 2016.

24. " Building Probabilistic Models, One Constraint at a Time," *Workshop on Predictive Multiscale Materials Modeling,* Isaac Newton Institute, Cambridge University, December 1-4 2015.

25. "Polynomial Chaos as a Comprehensive Modeling Tool for Complex Systems," *Workshop on Sensitivity, Error and Uncertainty Quantification for Atomic, Plasma, and Material Data,* Institute for Advanced Computational Science, Stony Brook University, New York, November 7-9, 2015.

26. "Decision Engineering: From Engineering Phenomena to Value," *NSF Workshop on Decision Engineering,* Arlington, VA October 30 2015.

27. "Introduction to Uncertainty Quantification," *Workhop on Uncertainty Quantification,* Beihang University, Beijing, China, August 6-18, 2015.

28. "Uncertainty Quantification for Complex Systems," Keynote lecture at *INFORM Roundtable Summer Meeting,* Jackson Hole Lodge, Moran, WY, July 19-20 2015.

29. "Uncertainty Quantification at the Interface of Modeling, Simulation, Manufacturing and Risk," *Workshop on the Synergy in Manufacturing and Computational Mechanics,* Hannover, Germany, July 13-14 2015.

30. "Building Stochastic Models, One Constraint at a Time," *AFOSR/DARPA/NCI Strategic Workshop: Convergence of Physical Sciences for Biomedical Applications: Phase Transition and Network Dynamics in Living and Non-Living Systems,* Arlington, VA, August 28 2014.

31. "Uncertainty Propagation for High-Performance Computing," *Spatial Statistics and Uncertainty Quantification on Supercomputers,* University of Bath, Bath, UK, May 19-21 2014.

32. "Hierarchical Probabilistic Models for High-Dimensional Data," *1st International Workshop on Data-Enabled Science,* May Shenzhen, Guangdong Province, China, May 14-17, 2014.

33. "Stochastic Dimension Reductions and Cross-scale Representations," *2014 Albany User Group Meeting,* CSRI, Sandia National Laboratories, January 14-16 2014.

34. "Model Reduction and Synthesis for UQ," *Advances in Uncertainty Quantification Methods, Algorithms and Applications (UQAW 2014)* , KAUST, January 6-10 2014.

35. "Uncertainty Quantification for Predictive Modeling of Materials," *ARO 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, 5-6 2013.

36. "Stochastic Models for Coupled Physics,", *3rd International Workshop on Moisture-Induced Damage in Asphalt Mixtures,* Doha, Qatar, April 16-19 2013.

37. "New directions in stochastic multiscale modeling," *Interplay of Theory and Numerics for Deterministic and Stochastic Homogenization,* Mathematisches Forschungsinstitut Oberwolfach, Germany, March 1-23, 2013.

38. "Uncertainty Quantification," *Scientific Workflows for Scattering Science,* Caltech, Pasadena, CA January 31-February 2, 2013.

39. "Stochastic modeling and prediction for the design and management of interacting complex systems," *NSF Workshop on Building Engineering Complex Systems,* Arlington, VA, January 24-25, 2013.

40. "Linear solvers for tensorized spaces," *IMA Annual Program Year Workshop on Theory and Applications of Stochastic PDEs*, the Institute for Mathematics and Its Applications (IMA), University of Minnesota, January 14-18, 2013.

41. "Reduced models for risk assessment of urban systems," *3rd International Symposium on Advances in Urban Safety (SAUS2012),* Nanjing, China, November 24-26, 2012.

42. "Random field representations and approximations for fixed point iterations," *Computational and Theoretical Challenges in Interdisciplinary Predictive Modeling Over Random Fields,* Texas Tech University, Lubbock, TX, October 26, 2012.

43. "Focus on objectives resolves the curse of dimensionality" *NASPDE12 (Numerical Solution of Stochastic PDEs)*, Warwick, UK, June 11-12, 2012.

44. "Uncertainty in Reduced Order Models : A blessing or a curse ?" at *Workshop on Reduced Basis, POD and PGD Model Reduction Techniques: a Breakthrough in Computational Engineering ?* Cachan, France, November 16-17-18, 2011.

45. "Uncertain Handshaking," *von Neumann Symposium on Multimodel and Multialgorithm Coupling for Multiscale Problems,* organized by the American Mathematical Society, Snowbird, Utah, July 4-7, 2011.

46. "Uncertainty Quantification in Industrial Problems," *IMA Workshop on Quantification of Uncertainty in Indsutrial Problems and Energy Applications,* the Institute for Mathematics and Its Applications (IMA), University of Minnesota, June 2-4, 2011.

47. "Uncertainty Quantification in Inverse Problems," *IMA Workshop on Large-scale Inverse Problems and Quantification of Uncertainty,* the Institute for Mathematics and Its Applications (IMA), University of Minnesota, June 6-10, 2011.

48. "From deterministic to stochastic multi-scaling and uncertainty analysis," *NSF Workshop on Challenges in Computational Multiscale Materials Modeling (CCMMM)*, Arlington, VA, May 4 2011.

49. "Dimension reduction and measure transformation in stochastic multiphysics modeling," BIRS Workshop on Stochastic Multiscale Methods, Banff, Canada, March 27-April 1 2011.

50. "Data-Driven Stochastic Modeling and Simulation", I. Yadegaran and R. Ghanem, *Workshop on Uncertainty Quantification for Multiphysics and Multiscale Systems,* USC, Los Angeles, CA, March 8, 2011.

51. "Comboul M. and Ghanem R., Stochastic models for natural and urban systems," *Workshop on Uncertainty Quantification for Multiphysics and Multiscale Systems,* USC, Los Angeles, CA, March 8, 2011.

52. "Uncertainty Characterization for Markov Chain's Transition Probabilities," H. Meidani, R.G. Ghanem, *Workshop on Uncertainty Quantification for Multiphysics and Multiscale Systems,* USC, Los Angeles, CA, March 8, 2011.

53. "Stochastic upscaling for waves in polycrystalline materials," *IPAM Workshop on Random Media: Homogenization and Beyond,* UCLA, Los Angeles, CA, January 24-29, 2011.

54. The Los Alamos National Laboratory workshop on *Mapping Out Future Directions for Uncertainty Quantification in Scientific Inference*, Santa Fe, November 4 2010.

55. "Uncertainty Challenges for SmartGrid," *Mathematics Challenges for SmartGrid,* Pacific Northwest National Laboratory, Richland, WA, August 17 2010.

56. Plenary talk: "Construction and Identification of Stochastic Models," *SICON'09, University of Rome - La Sapienza,* September 23 2009.

57. Comboul M., Ghanem R. and Becker T., "Crustal surface deformation time series analysis for transient detection," *SCEC annual meeting: transient detection exercise,* Palm Springs (California), September 2010.

58. "Information-Driven Predictions for Urban Sustainability," *THU-USC Faculty Forum on Green and Smart for Sustainable Future,* Davidson Center, USC, April 3 2010.

59. Invited participants at the AFOSR/AFRL "Multi-Scale Modeling Planning Workshop," Dayton, OH, December 9-10, 2009.

60. "Ubiquitous Sustainable Cities," invited presentation to the *Second SmartGrid Symposium,* USC, October 6, 2009.

61. *Mathematics for Analysis of Petascale Data (MAPD)*, Sponsored by U.S. Department of Energy, Office of Advanced Scientific Computing Research, Rockville, MD, Nov 6-8, 2008.

62. "Rational Model Validation Under Uncertainty with Application to Aeroelasticity," *AFRL/AFSEO/IHAAA Workshop on Aircraft-Stores Clearance and Related Aeroelastic Phenomena,* Sedona, AZ, October 27-28 2008.

63. *Uncertainty Analysis in Complex, MultiPhysics Applications,* Sponsored by the PSAAP University Alliance Center at Stanford, Stanford, CA, July 25-26, 2008.

64. *Workshop on Modeling Uncertainty in Integrated Assessment Models*, Sponsored by the U.S. Department of Energy, Office of Science and Argonne National Laboratory, Chicago, Il, July 21-22, 2008.

65. *PSAAP Predictive Science Alliance Academic Program Workshop,* a DOE Workshop, Albuquerque, NM July 8-9, 2008.

66. *SPE Applied Technology Workshop: Nanotechnology in Upstream E&P: Nano-Scale Revolutions to Mega-Scale Challenges ?* Dubai, UAE, 3-6 February 2008.

67. "Sustainability by Design: Prediction and mitigation of complex interactions in the urban landscape," National Science Foundation, WTEC Technology Assessment Workshop, Nov 1, 2007.

68. "An Overview of an Approximation Approach to Validation," *Sandia CSRI Workshop on Mathematical Methods for Validation,* New Mexico, August 14-16, 2007.

69. Ghanem, R. and Doostan, A., "Structural dynamics validation problem: An approximation-theoretic approach," *Validation Challenge Workshop,* Sandia National Laboratories, Albuquerque, NM, May 22-23, 2007.

70. "Integration of Polynomial Chaos Representations with the EnKF," *Workshop about Ensemble Kalman filter for updating of reservoir simulation models,* Hotel Edvard Grieg, Bergen Norway, 18-20 June 2007.

71. "Prediction Science, Uncertainty Quantification and Management," *AME Advisory Board,* January 31, 2007.

72. "Multiscale Analysis, Stochastic Analysis, and Model Validation: A Unifying Perspective through Polynomial Chaos Decomposition," Invited talk to Advances and Challengdes in the Solution of Stochastic Partial Differential Equations October 20-22, 2006, Brown University.

73. Plenary talk: *Stochastic Modeling Conference,* Center for Applied Mathematics, University of Notre Dame, IN, March 23-26, 2006.

74. "Error Budgets for the Validation of Predictive Models," invited participant and speaker at the *AFRL/AFSEO/IHAAA Workshop on Aircraft-Stores Clearance and Related Aeroelastic Phenomena,* Fountain Hills, AZ, May 16-17 2006.

75. Invited participant and speaker at the *Validation Methodology Workshop* at Sandia National Laboratories, Albuquerque NM May 22-23 2006.

76. Invited speaker at the *Workshop on Challenges in Computational Mechanics,* LMT-Cachan, France, May 10-12, 2006.

77. "Mechanics of uncertainty- the new interface of science and technology," Invited lecture at the *Mini-Symposium of Civil Engineering Research in 21st Century,* honoring the retirement of Professor Tadanobu Sato of Kyoto University, August 26, 2005, Tokyo Forum, Tokyo, Japan.

78. "Error Budgets: A Path from Uncertainty Quantification to Model Validation," *Advanced Simulation and Computing Workshop: Error Estimation, Uncertainty Quantification, and Reliability in Numerical Simulations*, Aug 22-23, 2005, Stanford University, Palo Alto, CA.

79. "Some contributions of stochastic analysis to multiscale modeling in mechanics," invited lecture at the *Workshop on Integrative Multiscale Modeling and Simulation in Materials Science, Fluids and Environmental Science,* CRM, Université de Montreal, Canada, May 11-15, 2005.

80. "Aspects of Stochastic Modeling in Multiscale Analysis," Invited participant and speaker at the *International Workshops on Advances in Computational Mechanics: Multiscale Problems and Related Computational Methods,* Tokyo, Japan, November 4-6, 2004.

81. Invited participants and speaker at the *Foundations'04 Workshop on Verification and Validation and Accreditation,* Tempe AZ, 13-15 October 2004.

82. "Uncertainty modeling and multiscale analysis: Opportunities. Challenges and Applications," Invited participant and speaker at the *Third DOE Workshop on Multiscale Mathematics,* Portland, OR, September 21-23, 2004.

83. Invited participant and speaker at the *Second DOE Workshop on Multiscale Mathematics,* Broomfield, CO, July 20-22, 2004.

84. Invited participant and organizer at the *First DOE Multiscale Mathematics Workshop,* Alexandria, VA, May 3-5, 2004.

85. "Inverse Analysis for Multiscale Stochastic Models," *Workshop in Inverse Problems in Solid Mechanics,* Rensselaer Polytechnic Institute, Troy, NY, March 28 2004.

86. "New methods for stochastic inverse analysis," Sandia Workshop on Optimization Under Uncertainty, Sandia National Laboratories, Albuquerque, NM, January 26-27, 2004.

87. "Research in Stochastic Predictive Models," NSF-Sandia Workshop on Life Cycle Engineering, Sandia National Laboratories, Albuquerque, NM, January 28-29, 2004.

88. Invited speaker at the *CIMMS-DARPA Workshop on Uncertainty Analysis in the Design of Dynamical Systems,* Caltech, Pasadena, CA October 17-18 2003.

89. Invited participant in the workshop *SCaleS: Science Case for Large-scale Simulation* organized by the Department of Energy, Arlington, VA June 24-25 2003.

90. "A Mathematical Framework for the Validation of Predictive Models," DOE-NSF-SIAM Workshop on Predictability of Complex Phenomena, Santa Fe, NM, December 17, 2002.

91. "Uncertainty Analysis and Management with PCORE-3D and PBORE-3D," Poromechanics Institute: Industrial Consortium Meeting, The University of Oklahoma, October 24, 2002

92. "Data Refinement for Confidence Management in Model-Based Predictions" AFOSR Program Review in Structural Mechanics. Arlington, VA, September 25, 2002.

93. "Stochastic modeling of materials for multi-scale applications," *Workshop on Multiscale Computational Mechanics for Materials and Structures,* September 18-20, 2002, Cachan, France.

94. "Fiabilité et Approches Stochastiques en Méchanique des Structures" *Workshop: Validation des Modeles de l'Ingenieur: Enjeux et Perspectives* Laboratoire de Mechanique et de Technology, École Normale Superieure de Cachan, France, June 7 2002.

95. "Computational Model Reduction and Probabilistic Model Synthesis for Uncertainty Quantification," ONR: Computational Mechanics and Structural Acoustics Program Review, Arlington, VA, April 15, 2002.

96. "The Worth of Information in Probabilistic Predictive Models," ONR: Program Review in Hull Assurance Program.Carderock, MD, April 02, 2002

97. "Quantifying and Managing Uncertainty in Model-Based Predicitons," Invited presentation at the DARPA Workshop on Uncertainty in Accelerated Insertion of Materials, Annapolis, MD, August 27-28 2001.

98. "Probabilistic Modeling of Uncertainty," a short course taught at Sandia National Laboratories, Albuquerque, NM, July-August 2001.

99. "Error Estimation for the Certification of Model-Based Predictions," Invited presentation to the Air Force workshop on "Uncertainty in Model Prediction," Albuquerque, NM, March 20-21 2001.

100. Invited participant to the US-Japan Workshop on Soil-Structure Interaction, Tsukuba, Japan, March 6-8, 2001.

101. Invited participant to the NRC panel on *Predictability and Limits of Prediction in Hydrological Sciences,* Boulder, CO, September 21-22, 2000.

102. Invited speaker at the Industrial Consortium Meeting for the Rock Mechanics Institute, the University of Oklahoma, Rock Mechanics Institute, "Reservoir Characterization Based on a Novel Representation of the Scales of Heterogeneity and its Application to Decision Support in Oil Recovery Processes," July 27 2000.

103. Invited by the Disaster Prevention Research Institute at the University of Kyoto to deliver a series of lectures at Japanese Universities and Research Institutes in Japan, January 5-22, 2000.

104. Invited Lecture at the *Third Annual DOE/MICS Workshop, Predictability of Complex Phenomena,* Los Alamos, December 6-8, 1999.

105. Invited participant to the *Workshop on Smart Materials and New Technologies for Improvement of Seismic Performance of Urban Structures,* Kyoto and Tokyo, February 16-20, 1999.

106. Invited participant to the *US-Japan Natural Resources Development Program (UJNR) workshop on Soil-Structure Interaction,* Menlo Park, CA, September 21-22, 1998.

107. Invited participant at the panel on *Prospects for Integrating Deterministic and Stochastic Finite Element Methods,* at the 12^{th} EMD Conference in La Jolla, CA, May 17-20, 1998.

108. Invited participant and speaker at the *US-Japan Workshop-Seminar on Infrastructural and Environmental Risk Assessment and Rehabilitation*, Kyoto, Japan, November 22-23 1997.

109. Invited participant at the NSF-sponsored *Second US-Japan Workshop on Mitigation of Urban Earthquake Disaster,* February 27-March 1 1997, Tokyo. Japan.

110. Invited participant at the *NRC Panel on High Performance Computing and Crisis Management,* June 13-15 1995, Newport Beach, CA.

111. Invited speaker at the *Panel on System Identification* at the ICOSSAR'93, *Adaptive Control of Uncertain Dynamical Systems.* Innsbruck, Austria, August 9-13, 1993.

112. Invited speaker at the *Workshop on Reliability Methods* at the ICOSSAR'93 in Innsbruck, *Expansion Techniques for Response Surface Approximation and Reliability Calculations,* Innsbruck, Austria, August 9-13 1993.

FUNDED RESEARCH

1. 2023-2027 *Computational Evaluation and Design of Actuators for Core-Edge Integration (CEDA),* funded by the US Department of Energy($300,000).

2. 2022-2024 *H2 Gas Turbine Thermal Barrier Coating Durability and Process Enhancement with Revolutionary Probabilistic Machine Learning (H2ThERMaL),* funded by the US Department of Energy($1,000,000).

3. 2022-2027 *Multiphase Detonation of Liquid Aeropropulsion Fuels,* MURI, funded by ONR, ($1,000,000).

4. 2021-2026 *Discovering & Modeling Turbulence and Chemistry Interactions in High Speed Reactive Flows,* MURI, funded by ONR, ($1,238,000).

5. 2022-2024 *Probabilistic Impact Scenarios for Extreme Weather Event Resilience,* funded by Sandia National Laboratories ($80,000)

6. 2021-2024 *Development of Tailored Fiber Placement, Multi-Functional, High-Performance Composite Material Systems for High Volume Manufacture of Structural Battery Enclosure,* Funded by DOE with GM as prime ($1,137,500).

7. 2021-2023 *Risk-informed condition assessment of spent nuclear fuel canisters using experimental measurements and high-fidelity computational models,* Funded by NRC, ($323,000).

8. 2020-2023 *Multiscale Stochastic Modeling, Conditioning, and Simulation of rare events,* Funded by AFOSR, ($1,391,586).

9. 2020-2025 *FASTMATH: SciDAC5*, Funded by the Department of Energy ($465,000) (part of a DOE SciDAC Institute).

10. 2020-2022 *Unsupervised Learning Algorithms for Autonomous Trajectory Analysis,* Funded by Sandia ($174,000).

11. 2018-2020 *Physics Informed Research Assistant for Theory Extraction (PIRATE),* Funded by DARPA ($1,000,000).

12. 2017-2020 *FASTMATH: SciDAC4*, Funded by the Department of Energy ($265,000) (part of a DOE SciDAC Institute).

13. 2018 *Algorithms for machine learning under uncertainty,* Funded by Lawrence Livermore National Laboratory ($30,000).

14. 2017-2018 *Risk-Based Unmanned Air System (UAS) Mission Path Planning Capability,* Funded by Navy STTR to ACTA-Inc. ($67,500).

15. 2017-2020 *Surge, and Tsunami Overland Hazard, Loading and Structural Response for Developed Shorelines,* Funded by NSF (PI is Pat Lynett). ($300,000)

16. 2016-2020 *Cask Mis-Loads Evaluation Techniques,* Funded by NUEP (PI is Bora Gencturk). ($400,000).

17. 2016-2019 *Reduced Stochastic Models for Design Optimization of a Scramjet,* Funded by DARPA. ($490,000).

18. 2015-2017 *Near Real-Time Quantification of Stochastic Model Parameters,* Funded by Applied Mathematics, Inc. ($300,000).

19. 2015-2019 *Development and Integration of Predictive Models for Manufacturing and Structural Performance of Carbon Fiber Composites in Automotive Applications,* Funded by General Motors LLC ($1,058,000).

20. 2014-2016 *RIPS Type 1: Human Geography Motifs to evaluate Infrastructure Resilience,* Funded by NSF ($ 100,000).

21. 2013-2014 *Confident Predictions of Reservoir and Well Bore Flow using Reduced Models and Data,* Funded by the National Energy Technology Lab (NETL) ($ 300,000).

22. 2012-2014 *Environmental Sustainability and the Global Economy,* Funded by the USC Provost Office ($50,000).

23. 2011-2016 *Quantifications of Uncertainty in Extreme Scale Computations (QUEST): SciDAC*, Funded by the Department of Energy ($ 750,000) (part of a $7M DOE SciDAC Institute).

24. 2010-2012 *Validation of Predictive Models for the Ablation of Re-Entry Vehicles,* Funded by The University of Texas at Austin ($ 220,000) (part of a DOE PSAAP Center).

25. 2010-2012 *Stochastic Prediction for Design and Management of Interacting Complex Systems,* Funded by NSF ($310,000).

26. 2009-2011 *EAGER: Accelerating Innovation in Agent-Based Simulations: Applications to Complex Socio-Behavioral Phenomena,* Funded by NSF ($90,000).

27. 2009-2012 *Uncertainty Quantification for Petascale Simulation of Carbon Sequestration Through Fast Ultra-Scalable Stochastic Finite Element Methods,* Funded by NSF, ($1,200,000).

28. 2009-2012 *Analysis and Reduction of Complex Networks Under Uncertainty,* Funded by DoE, ($300,000).

29. 2009-2012 *Mathematical and Computational Tools for Predictive Simulation of Complex Coupled Systems Under Uncertainty,* Funded by DoE, ($625,000).

30. 2009 *Workshop on Stochastic Multiscale Methods,* Funded by NSF, ($25,000.)

31. 2009 *Workshop on the Quantification of Uncertainty in Complex Interacting Systems,* Funded by NSF, ($75,000.)

32. 2007 *Effect of Climate Change on Transportation System in Los Angeles,* Funded by METRANS, ($90,000.)

33. 2007-2010 *Integrated computational system for probability based multi-scale model (PMM) of ductile fracture in heterogeneous materials,* Funded by NSF, ($165,000.)

34. 2007*Path for integrating Polynomial Chaos into Sandia analysis tools,* Funded by Sandia National Laboratories, Albuquerque, NM, ($87,000.)

35. 2006-2009 *Collaborative Research: CMG-Stochastic Quantization for Modeling the Dynamics of Regional Seismicity,* Funded by NSF, ($317,978.)

36. 2006-2011 *MURI: A Multidisciplinary Approach to Health Monitoring and Materials Damage Prognosis for Metallic Aerospace Systems,* Funded by AFOSR, ($623,767.)

37. 2005-2008 *Computational Algorithms and Reduced Order Models for Stochastic PDEs,* Funded by NSF, ($250,000.)

38. 2003 *Workshop on Uncertainty Quantification and Error Estimation,* Funded by NSF, ($25,000.)

39. 2002-2005 *Uncertainty Joints for Validating UNDEX Models,* Funded by the Office of Naval Research, ($365,000.)

40. 2002-2005 *Stochastic Optimization using Polynomial Chaos Decompositions with Applications to Obstacle Identification and Material Characterization,* Funded by the Office of Naval Research, ($365,000.)

41. 2002-2004 *Optimal Structural System Design for Catastrophic Unforeseen Events* Funded by NSF, ($100,000).

42. 2001-2004 *Data Refinement for Confidence Management in Model-Based Predictions with Application to Boundary Interfaces and Uncertainties in Structural Joints,* Funded by the AFOSR, ($180,000.)

43. 2001-2006 *Instrumentation to Measure the Emission and Transport of Biological Aerosols into the Atmosphere: Linking Across Scales from Microns to Kilometers,* co-PI with Drs. Marc Parlange, Charles Meneveau, Joe Katz, Grace Brush, and Shiyi Chen, Funded by the National Science Foundation, ($2,500,000.)

44. 2001 *Uncertainty Propagation in Models of Thermo-Fluid Systems,* co-PI with Dr. Omar Knio, Funded by Sandia National Laboratories, Livermore, ($40,000.)

45. 2000-2005 *Implementation of Chaos Expansions into Analysis Software,* Funded by Sandia National Laboratories, Albuquerque ($ 450,000.)

46. 2000-2003 *Mine Detection Modeling and Simulation in a Random Environment,* Funded by the Office of Naval Research ($455,651.)

47. 2000-2003 *Quantitative Uncertainty Assessment and Numerical Simulation of Micro-Fluid Systems,* co-PI with Drs. Omar Knio and Habib Najm, Funded by DARPA, ($1,000,000.)

48. 1999-2002 *Monitoring and Classification of Emissions from Structure-Fluid Interaction in the Medium Frequency Range Using Statistical Inference,* Funded by the Office of Naval Research ($295,000.)

49. 1999-2002 *A Method to Quantify the Worth of Information with Applications to the Monitoring and Inspection of Ship Structures,* Funded by the Office of Naval Research ($295,000.)

50. 2000-2001 *REU Supplement,* Funded by the National Science Foundation, ($13,750.)

51. 1999-2000 *REU Supplement,* Funded by the National Science Foundation, ($13,750.)

52. 1998-2001 *Decision Support for Flow in Porous Media: Optimal Sampling for Data Assimilation,* Funded by the National Science Foundation, ($209,621.)

53. 1998-2001 *A General Framework for Propagating Uncertainty in Physical Systems with Application to Thermal Transport in a Random Porous Medium,* Funded by Sandia Laboratories, Albuqurque ($275,481).

54. 1997-1999 *Reliability of Civil Infrastructure Systems: Risk Reduction Using Advanced Sensor Technology,* Taisei Corporation, Japan ($40,000.)

55. 1996-1997 *A Stochastic Finite Element Program for Dynamic Soil-Structure Interaction,* SBIR-Phase 1, The National Science Foundation, ($ 100,000), Jointly with Stevenson and Associates, Clevelend, OH.

56. 1996-1997 *Development of a Computational Laboratory for the Analysis and Design of Electro- and Magneto-Rheological Fluids,* The School of Engineering, The Johns Hopkins University ($18,000.)

57. 1995 *State of the Art and State of the Practice for Retrofit, Repair, Maintenance, and Renewal Engineering of Civil Structures.* Funded by Shimizu Corporation, Japan ($9,000.)

58. 1996-1998 *Stochastic Finite Element Analysis of Contaminant Transport in Porous Media: REU Supplement* Funded by the National Science Foundation ($11,000.)

59. 1994-1997 *Stochastic Finite Element Analysis of Contaminant Transport in Porous Media.* Funded by the National Science Foundation ($210,000.)

60. 1994-1995 *Energy Dissipation Systems, Hybrid Control Systems, and Elastomeric Isolation Systems.* Funded by NCEER ($28,500.)

61. 1992-1994 *Novel Nonlinear Method for Dynamic Analysis of Pile Foundations,* Co-PI with George Gazetas. Funded by Shimizu Corporation ($95,000.)

62. 1992-1993 *Energy Dissipation Systems, Hybrid Control Systems, and Elastomeric Isolation Systems.* Funded by NCEER ($25,000.)

63. 1992-1993 *GIS Applications in Hydrological and Geotechnical Studies.* Funded by the CIRD ($20,000.)

64. 1992-1993 *Adaptive System Identification and Control for Underground Tunneling.* Funded by the CIRD ($10,000.)

65. 1992-1993 *Software Acquisition for Stochastic Analysis of Crude Oil Spills.* Funded by NCEER ($3,000.)

66. 1992-1994 *Stochastic Finite Element Analysis of Ground Water Flow and Contaminant Transport.* Funded by Takenaka Corporation, Japan ($30,000.)

SUPERVISED STUDENTS

Postdoctoral Associates and Visiting Scholars:

1. Philippe Hawi (Ph.D. USC), 2024.
2. Gabriele La Valle (Ph.D. University of Messina, Italy), 2024
3. Nurtaj Hossain Md (Ph.D. IISc), 2022-2024
4. Vinay Kumar (Ph.D. IIT), 2022-2024
5. Xiaoshu Zeng (Ph.D. USC), 2022-2024
6. Zhiheng Wang (Ph.D. USC), 2022
7. Mehrdad Aghagholizadeh (Ph.D. SMU), 2021-
8. Xiaohui Tu (Ph.D. JHU), 2021-
9. Ziad Ghauch (Ph.D. USC), 2019.
10. Ruda Zhang (Ph.D. USC), 2018.
11. Xiao Liang (Associate Professor, Shandong University of Science, and Technology, Qingdao, China), 2017-2018.
12. Olivier Ezvan (Ph.D. Paris-Est), 2017-2020.
13. Panagiotis Tsilifis (Ph.D. USC), 2016-2017.
14. Charanraj Thimmisetty (Ph.D. USC), 2016.

15. Jing Chen (Professor, Hohai University, China) 2016.
16. Loujaine Mehrez (Ph.D. U Southampton, UK), 2015-2020.
17. Jianyu Li (Associate Professor at Tianjin University of Science and Technology, China), 2014.
18. Hadi Meidani (Ph.D. USC), 2012-2013.
19. Evangelia Kalligiannaki (Ph.D. Crete, Greece), 2012-2013.
20. Bedrich Susedik (Ph.D. CU Denver, CO), 2011-2013.
21. Johann Guilleminot (Assistant Professor at Université Paris-Est), 2010.
22. Maarten Arnst (Ph.D. ECP, France), 2007-2011.
23. Sonjoy Das (Ph.D. USC), 2008-2010.
24. Yongbo Peng (Ph.D. Tongji University), 2007-2008.
25. Jianbing Chen (Associate Professor at Tongji University, Shanghai, China), 2006-2007.
26. Alireza Doostan (Ph.D. Johns Hopkins), 2006.
27. Steve Wojtkiewicz (Ph.D. UIUC), 2005.
28. Alain Matta (Ph.D. Johns Hopkins), 2004.
29. Jianxu Shi (Ph.D. Johns Hopkins), 2003-2004.
30. Beatrice Faverjon (Ph.D. CNAM, France), 2003.
31. Bernard Hayek (Ph.D. Johns Hopkins), 2001-2003.
32. Riki Honda (Ph.D. Kyoto University), 2002-2003.
33. Mohamed Jardak (Ph.D. École Polytéchnique de Montreal), 2001-2003.
34. Hayder Saeed (Ph.D. University of Rome, La Sapienza), 2001-2002.
35. Abhijit Sarkar (Ph.D. Oxford University), 1999-2000.
36. Shigehiro Sakamoto (Ph.D. Tokyo University, Engineer at Taisei Corporation), 1997-1999.

Doctoral Students:

1. Samir Sarrieddine (2023-present)
2. Wenwen Han (2023-present)
3. Anna Arcaro (2021-present): Prognostics for spent nuclear fuel containment
4. Zhengtao Yao (2021-present): AI/ML for fiber-reinforced composites
5. Zheming Gou (2020-present): Predictive models for rare events
6. Kelli McCoy (2020-present): Statistical learning for digital twin frameworks.
7. Philippe Hawi (2018-2024): Probabilistic learning for prognostics and design
8. Zhiheng Wang (2022): *A Polynomial Chaos Formalism for Uncertainty Budget Assessment.* (Assistant Prof. at Texas Tech U)

9. Xiaoshu Zeng (2022): *Efficient Inverse Analysis with Dynamic and Stochastic Reductions for Large-Scale Models of Multi-Component Systems.*

10. Ziad Ghauch, Ph.D. 2018 *Comprehensive uncertainty quantification in composites manufacturing processes.* (Data Science at Bank of London)

11. Ruda Zhang, Ph.D. 2018 *Multidisciplinary models for urban sustainability.* (Assistant Prof. U Houston)

12. Panos Tsilifis, Ph.D. 2016, *Design, adaptation and variational methods in uncertainty quantification.* (GE Research Center)

13. Charan Thimmisetty, Ph.D. 2016, *Risk Assessment, Intrinsic Interpolation and Computationally Efficient Models for Systems under Uncertainty.* (CISCO)

14. Nastaran Bassam Zadeh, Ph.D. 2016, *Probabilistic Data-Driven Predictive Models for Energy Applications.*

15. Shivang Desai, Ph.D. 2016, *Stochastic perydynamics and Upscaling.* (postdoc ASU)

16. Vahid Keshavarzzadeh, Ph.D. 2014, *Design Optimization under Uncertainty for Rotor Blades of Horizontal Axis Wind Turbines.* (postdoc Mech Eng UIUC)

17. Daniel Lakeland, Ph.D. 2013, *Continuum Modeling Techniques and Their Application to the Physics of Soil Liquefaction and Dissipative Vibrations.* (co-advised with Amy Rechenmacher).

18. Hamed Haddad Zadegan, Ph.D. 2013, *Data Worth Analysis in Geostatistics and Spatial Prediction.* (Engineer, LADWP)

19. Ramakrishna Tipireddy, Ph.D. 2013, *Algorithms for Stochastic Galerkin Projections: Solvers, Basis Adaptation and Multiscale Modeling and Reduction.* (PNNL.)

20. Hadi Meidani, Ph.D. 2012, *Uncertainty Management for Complex Systems of Systems.* (Associate Professor, Civil Engineering at UIUC.)

21. Maud Comboul, Ph.D. 2012, *Stochastic and Multiscale Models for Urban and Natural Ecology.* (postdoc, Earth Sciences, USC.)

22. Arash Noshadravan, Ph.D. 2011, *Stochastic Characterization, Realization and Upscaling of Polycrystalline Materials.* (Assistant Prof. Taxes A&M)

23. Sonjoy Das, Ph.D. 2008, *Modeling, Identification & Analysis of Complex Stochastic Systems: Applications in Stochastic Partial Differential Equations and Multiscale Mechanics.* (Assistant Professor of Mechanial Engineering at SUNY Buffalo.)

24. George Saad, Ph.D. 2006, *Stochastic Data Assimilation with Application to Multi-Physics and Health Monitorin Problems.* (Assistant Professor of Civil Engineering at the American University of Beirut.)

25. Alireza Doostan, Ph.D. 2006, *Probabilistic Construction and Numerical Analysis of Model Verification and Validation.* (Professor of Aerospace Engineering at CU Boulder.)

26. Zenon Medina-Cetina co-advised with Amy Rechenmacher, Ph.D. 2006 *Probabilistic Calibration of a Soil Model.* (Professor of Civil Engineering at Texas A&M.)

27. Debraj Ghosh, Ph.D. 2005 *On the Characterization and Analysis of the Random Eigenvalue Problem.* (Professor of Civil Engineering at Indian Institute of Science, Bangalore.)

28. Zou Yu Ph.D. 2005 *Equation-Free Particle-Based Computations in Multiple Dimensions and Multiscale Data Assimilations with the Ensemble Kalman Filter.* (VP at CitiGroup.)
29. Carol El-Hayek, Ph.D. 2005 *Portfolio Optimization and Value of Information for Catastrophe Insurance.*
30. Jianxu Shi, Ph.D. 2003 *Stochastic Modeling of Materials with Complex Microstructure.*
31. Alain Matta, Ph.D. 2003 *Numerical Simulation and Uncertainty Quantification in Microfluidic Systems.* (Assistant Professor of Civil Engineering, Notre Dame University, Lebanon).
32. Manuel Pellissetti, Ph.D., 2003 *On Estimating the Error in Stochastic Model-Based Predictions.* (AREVA Nuclear Power, Germany).
33. Bernard Hayek, Ph.D., 2001 *Resource Allocation for Complex Systems in the Presence of Uncertainty.* (Partner, Dar Al-Handassah Group).
34. Zhou Wang: Ph.D., 2001 *Computational Model of Interacting Suspensions at Low Reynolds Number in the Presence of External Fields.*
35. Chris Pettit, Ph.D., 1998 *Wavelet Analysis and Multi-Scale Pattern Classification in Wind Engineering,* co-advised with Nick Jones (Associate Professor at the U.S. Naval Academy.)
36. Maged El-Mestkawy: Ph.D., 1998, *Discrete Element Simulation of Soil Liquefaction under Cyclic Loading.*
37. Samar Dham: Ph.D., 1998, *Computational Methods for Multiphase Flow in Heterogeneous Porous Media.*

Masters Students:

1. Asmita Shresta, M.S. (2023) *ML for managing extremes of power grid under changing climate.*
2. Dubar Kamara, M.S. 2002 *Computational Stochastic Modeling of Ocean Circulation.*
3. Julie McGlosson, M.S. 2001 *Sampling Techniques for Uncertainty Quantification.*
4. Francesco Romeo: M.S., 1997, *Structural Health Monitoring and Dynamical Systems Analysis using Wavelets.*
5. Bernard Hayek: M.S., 1996, *Hydrodynamic Circulation Models for Ocean Currents.*
6. Konson Wang: M.S., 1995, *Finite Element Modeling of Vehicle Crashworthiness and Handling.*
7. Kandasamy Rathinasamy: M.S., 1993, *Visualization Tools and Database Models for Computational Mechanics.*
8. Mark Green: M.S., 1994, *Stochastic Sensitivity Analysis of Ground Water Flow and its Implementation in a Distributed Computing Environment.*
9. Ren-Fen Li: M.S., 1994 *First Passage Problem in Nonlinear Random Vibration.*
10. LanFan Kong: M.S., 1994, *System Identification of Pile Group Impedance.*
11. Maxim Bujakov: M.S., 1994, *Robust Dynamic Control with Applications to Electro-Rheological Materials.*
12. Robert Kruger: M.S., 1994, *Efficient Solution Techniques for Spectral Stochastic Finite Element.*

13. Imad Dana: M.S., 1994, *Implementation of GIS for Environmental Impact Assessment.*

Undergraduate Students:

1. Joel Kim (2024-) (Topic: ML for micrograph analysis).
2. Emma Silversetin: 2023 (Topic: ML for managing flightpath modifications.)
3. Argin Dermegerdichian: 2021-2022 (Topic: Scientific workflows for integrated manufacturing processes).
4. Meghna Kiran: 2020-2022 (Topic: LSDYNA models for vehicle crash analysis).
5. Charlie Neuenschwander: 2021-present (Topic: Data sources and ML for socio-economic impact of oil spills in the Gulf of Mexico).
6. Kathryn Huang: 2020-2021 (Topic: Machine Learning for assessing COVID-19 spread).
7. Wenwen Tang: 2020 (Topic: Data analytics for risk assessment.)
8. Salamah Haddad: summer 2012 (Topic: Physics of fuel cells.)
9. Maxime Colombe: 2011-2012 (Topic: Entropy-based models for Los Angeles.)
10. Reid Kawamoto: 2012 (Topic: Input-Output models for Southern California.)
11. Brian Adams: 2010 (Topic: Uncertainties in early-stage design and relation to life-cycle management.)
12. Aritra Chatterjee: summer 2010 (Topic: Review of performance-based design methodologies.)
13. Katie Hickey: 2007-2008 (Topic: review of climate change effects on Los Angeles).
14. Nabil Katicha: summer 2007 (Topic: CAD models for heterogeneous subsurface models.)
15. Brian Kannard: 2005-2007 (Topic: Computer Model of a Human Liver.)
16. Nathan Racklyeft: summer 2006 (Topic: Computer Model of a Human Liver.)
17. Christie Ferguson: summer 2006 (Topic: GIS Integration for Natural Resources.)
18. Reuben Brewer: 2003-2004 (Topic: Modeling tools in computational mechanics.)
19. Ken Loh: spring 2001-2003 (Topic: Compile electromagnetic properties for material used in infrastructure.)
20. Jennifer Abras: 2001-2003 (Topic: Computational Modeling of Uncertain Systems.)
21. Mark Staley: 2001-2003 (Topic: Computational Modeling of Uncertain Systems.)
22. Dubar Kamara: 1999-2001 (Topic: The Development of a Java-Based Tool for the Simulation of Stochastic Processes.)
23. Samar Malek: 1998-2003 (Topics: Review of Data Formats for Natural Resources Applications; Simulation of SAR Cross-Sections for Urban Areas; Stochastic Finite Elements; FEM for Joints.)
24. Marta Alonso: 1999-2000 (Topics: GIS for Natural Resource Management; CAD Models for Urban Areas.)
25. Matt Hayden: 1998-1999, (Topic: Finite Element Analysis for Damage Detection.)

26. Handler Gregor: 1997-1998, (Topic: A Review of the Interaction Mechanisms of Wind with Cable-Suspended Bridges.)
27. Jane Raba: 1997-1999 (Topics: Internet-Based Frame Analysis Program Using Java; Data Formats for GIS and Environmental Sustainability.)
28. Arnab Gupta: 1997 (Topic: Solid Mechanics Applied to the Human Body.)
29. Maria Rivera: 1997 (Topic: Basic Interactions in Electro Rheological Fluids.)
30. Andrew Clemens: 1997 (Topic: Computer Visualization of Granular Flows.)
31. Mark Green: 1993 (Topic: Flow Characterization in Heterogeneous Porous Media.)

TEACHING

. Structural Dynamics
. Advanced Mathematics for Engineers
. Finite Element Methods
. Probabilistic Methods For Engineers
. Electrodynamics of Continuous Media
. Engineering Graphics and Design
. Theoretical Methods in Computational Mechanics
. Statics
. Structural Mechanics
. Stochastic Optimization
. Entropy Methods in Mechanics
. Data Analytics for Civil Engineers
. Introduction to computer programming
. Random Vibrations
. Advanced Finite Elements
. Reliability
. Theory of Structures
. Discrete-Time Dynamical Systems
. Dynamics
. Wave Propagation
. Transport in Porous Media
. Multiscale Methods
. Uncertainty Quantification
Intro Programming for CEE

PROFESSIONAL ACTIVITIES

University Services:

University of Southern California

- Provost Committee for Data Infrastructure (2021-present)
- VSoE Faculty Council (2021-present)
- VSoE APT Committee (2017-2019)
- CEE Faculty Search Committee (2018, 2019, 2020)
- CEE Merit Review Committee (2018)
- CEE Structures Curriculum Committee (2014-present)
- AME Merit Review Committee (2014-2015)
- AME and CEE Promotions Committee (2014-2015)
- AME PhD Admissions Committee (2012-2015)
- Applied Mathematics Task Force (2009-2011)

- Advisory Board Committee, Department of Aerospace and Mechanical Engineering (2008-2011)
- USC Committee on Faculty Rights and Responsibilities (2009-present)
- USC Committee on Academic Policies and Procedures (2008-present)
- Graduate School Committee on Fellowships, Prizes and Awards (2008-present)
- Member of the interview panel for the Trustee and Presidential Scholarships (2007-2009)
- Viterbi School of Engineering (VSoE) Energy Initiative (2007-2010)

Johns Hopkins University

- University Communication Networks and Computing Committee
- The School of Engineering Curriculum Committee
- Civil Engineering Department Computing Committee

Editorial Services:

1. Executive Editor, *Data Centric Engineering, (published by Cambridge U Press),* 2019-present.
2. Associate Editor, *AIAA Journal,* 2012-2020.
3. Associated Editor, *Foundations of Data Science, (published by American Institute for Mathematical Sciences)* 2019-present.
4. Associate Editor *Advanced Modeling and Simulation in Engineering Sciences, (published by Springer)* 2020-present.
5. Associate Editor, *SIAM Journal on Uncertainty Quantification (published by SIAM),* 2012-2022.
6. Associate Editor, *SIAM Journal on Multiscale Modeling and Simulation (published by SIAM),* 2011-present.
7. Editorial Board, *Data-Enabled Discovery and Analysis, (published by Springer)* 2012-2017.
8. Editorial Board, *Mechanics of Advanced Materials and Structures Journal (MAMS) (published by Taylor and Francis),* 2011-present.
9. Advisory Board, *Computational Mechanics (published by Springer),* 2014-present.
10. Editorial Board, *Computer Methods in Applied Mechanics and Engineering (published by Elsevier),* 2011-present.
11. Editorial Board, *International Journal of Uncertainty Quantification (published by Begell House),* 2009-present.
12. Editorial Board, *Probabilistic Engineering Mechanics (published by Elsevier),* 1998-present.
13. Advisory Board, *Journal of Multiscale Computational Engineering (published by Begell House),* 2002-present.
14. Editorial Board, *Structure and Infrastructure Engineering (published by Taylor and Francis),* 2007-present.

15. Guest Editor, special issue on "Uncertainty Quantification," in *AI EDAM - Artificial Intelligence for Engineering Design Analysis and Manufacturing*, Volumes 31 and 32, 2017.

16. Guest Editor, special issue on "Structural Health Monitoring and Prognosis of Aerospace Structures," in the *Journal of Intelligent Material Systems and Structures,* 2012.

17. Guest Editor, special issue on "Uncertainty Quantification" in the *Journal of Theoretical and Computational Nanoscience,* Vol. 6, No. 10, 2009.

18. Guest Editor, special issue on "Uncertainty Quantification" in the *International Journal for Numerical Methods in Engineering,* Vol. 80, No. 6-7, 2009.

19. Guest Editor, special issue on "Uncertainty Quantification" of the *SIAM Journal on Scientific Computing,* Vol 26, No. 2, 2005.

20. Guest Editor, special issue on Structural Health Monitoring of the *Journal of Engineering Mechanics,* July 2000.

21. Associate Editor, *ASCE, Journal of Engineering Mechanics,* 2000-2004.

Professional Services:

1. Elected President of the *International Association for Structural Safety and Reliability, (IASSAR)*, 2023-present.

2. Elected Chair of the *SIAM Activity Group (SIAG) on Uncertainty Quantification,* January 2017-2019.

3. Member of the NRC Review Panel on Ballistics Science and Engineering at the Army Research Laboratory, 2015-2019, 2020-present.

4. Member of the NRC Review Panel on Assessment and Analysis at the Army Research Laboratory, 2016.

5. Elected Member *U.S. National Committee for Theoretical and Applied Mechanics,* 2014-2017, 2022-present.

6. Elected Member of the *USACM Executive Council*, 2014-2018.

7. Elected President of the Engineering Mechanics Institute of ASCE, 2011-2013.

8. Founding Chairman, USACM Committee on Uncertainty Quantification, 2011-2015.

9. Program Director, SIAM Activity Group (SIAG) on Uncertainty Quantification, 2010-2012.

10. Member, *U.S. National Research Council Committee on Mathematical Foundations of Validation, Verification, and Uncertainty Quantification,* 2010-2012.

11. Chartered Member of the *European Association of Structural Dynamics* (EASD).

12. Member of the *Board of Governors of the ASCE Engineering Mechanics Institute,* 2003-2013.

13. Chairman, Dynamics Committee, ASCE Engineering Mechanics Division, 2001-2003.

14. Chairman, Programs Committee, ASCE Engineering Mechanics Division, 1999-2003.

15. Chairman, Task Group on Frontiers of Mechanics in Civil Engineering, ASCE Engineering Mechanics Division, 2001-present.

16. Chairman, Probabilistic Mechanics Committee, ASCE Engineering Mechanics Division, 2003-2005.
17. News Correspondent, ASCE Engineering Mechanics Division, 1993-1999.
18. College of Reviewers for the Canada Research Chairs program, 2003-present.
19. Technical reviewer for many professional journals across science and engineering.
20. Thesis reviewer and Habilitation Committees at Brown University, the Universities of Tokyo and Kyoto, Université de Lille, L'École Centrale de Paris, L'École Centrale de Lyon, Conservatoire National des Arts et Métiers, University of Rome "La Sapienza", and National University of Singapore, Université Paris Est, Bergische Universität Wuppertal, Université de Nantes, Université Pierre et Marie Curie.
21. Organized hundreds of technical sessions at various national and international conferences in civil, mechanical and aerospace engineering and applied mechanics and mathematics.

Organized Conferences and Workshops:

1. co-Chair, *US National Congress on Computational Mechanics (USNCCM),* 2027.
2. co-Chair , *International Conference on Theoretical and Applied Mechanics, (ICTAM)*, Pasadena Convention Center, June 2026.
3. Chairman, *15th International Conference on Structural Safety and Reliability, ICOSSAR'25,* USC, June 2025.
4. Co-Organizer of the *BIRS Workshop on Uncertainty Quantification in Neural Network Models,* Banff, Canada, February 2025.
5. Organizer of the *Summer School on Uncertainty Quantification,* USC, Los Angeles, 2012-2019, 2022-2024.
6. Co-Organizer of the Workshop on *Machine Learning and Uncertainty Quantification, MLUQ,* USC, Los Angeles, CA, June 6-9, 2018, July 25-26, 2019, June 2020.
7. Co-Organizer of the workshop on *Data-Science in Civil Engineering,* Shanghai, China, June 7-9, 2019.
8. Co-Organizer of the *Workshop on Research Challenges and Opportunities at the interface of Machine Learning and Uncertainty Quantification,* University of Southern California, Los Angeles, June 4-6, 2018.
9. Co-Organizer of the *BIRS Workshop on Computational Methods for Uncertainty Quantification,* Banff, Canada, October 8-13 2017.
10. Co-organizer of the *ICERM (Institute for Computational and Experimental Research in Mathematics) Semester Program on "Computational Challenges in Probability"*, September 5, 2012 - December 7, 2012.
11. Co-organizer of the *SAMSI (Statistical and Applied Mathematical Sciences Institute) Uncertainty Quantification Program,* 2011-2012.
12. Co-organizer of the *BIRS Workshop on Stochastic Multiscale Methods,* Banff, Canada, March 27-April 1 2011.

13. Organizer of *Uncertainty Quantification for Multiphysics and Multiscale Systems,* University of Southern California, Los Angeles, CA, March 8 2011.

14. Co-organizer of the Los Alamos National Laboratory workshop on *Mapping Out Future Directions for Uncertainty Quantification in Scientific Inference*, Santa Fe, November 4 2010.

15. Co-chairman of EMI2010, the Engineering Mechanics Institute Annual Conference, Los Angeles, CA , August 8-11, 2010.

16. Organizer of the NSF workshop on *Stochastic Multiscale Methods,* University of Southern California, August 9-10, 2009.

17. Organizer of the NSF workshop on : *Uncertainty Quantification in Complex Interacting Systems,* University of Southern California, April 11-13, 2009.

18. Organizer of the workshop on : *Opportunities and Challenges in the Development of Polynomial Chaos Methods,* University of Southern California, August 21-22, 2008.

19. Co-chairman of the 9^{th} *ASCE Specialty Conference on Probabilistic Mechanics,* Albuquerque, NM, July 26-28 2004.

20. Organizer of the workshop on : *Elements of Predictability,* Johns Hopkins University, November 13-14 2003.

21. Organizer of the workshop on : *Uncertainty Analysis and Management: Setting a Research Agenda,* Johns Hopkins University, August 16-18 1999.

22. Co-chairman, 13^{th} *ASCE Engineering Mechanics Conference,* The Johns Hopkins University, Baltimore, June 1999.

PATENTS:

1. US Patent Number: 10717244: Roger G Ghanem, Venkateshwar R Aitharaju, Hamid G Kia, *Manufacturing control systems and logic for prognosis of defects in composite materials,* 2020.

MEMBERSHIP IN PROFESSIONAL SOCIETIES:

1. Member: AIAA, SIAM, USACM, WCCM, AAAS, EMI, ASCE.