

# Nicholas Zabaras

## List of Publications by Year in descending order

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78  
papers

4,685  
citations

136950

32  
h-index

98798

67  
g-index

81  
all docs

81  
docs citations

81  
times ranked

2696  
citing authors

#	ARTICLE	IF	CITATIONS
1	Physics-constrained deep learning for high-dimensional surrogate modeling and uncertainty quantification without labeled data. <i>Journal of Computational Physics</i> , 2019, 394, 56-81.	3.8	510
2	Bayesian deep convolutional encoder-decoder networks for surrogate modeling and uncertainty quantification. <i>Journal of Computational Physics</i> , 2018, 366, 415-447.	3.8	397
3	An adaptive hierarchical sparse grid collocation algorithm for the solution of stochastic differential equations. <i>Journal of Computational Physics</i> , 2009, 228, 3084-3113.	3.8	381
4	Sparse grid collocation schemes for stochastic natural convection problems. <i>Journal of Computational Physics</i> , 2007, 225, 652-685.	3.8	349
5	A Bayesian inference approach to the inverse heat conduction problem. <i>International Journal of Heat and Mass Transfer</i> , 2004, 47, 3927-3941.	4.8	202
6	Deep Convolutional Encoder-Decoder Networks for Uncertainty Quantification of Dynamic Multiphase Flow in Heterogeneous Media. <i>Water Resources Research</i> , 2019, 55, 703-728.	4.2	201
7	An inverse method for determining elastic material properties and a material interface. <i>International Journal for Numerical Methods in Engineering</i> , 1992, 33, 2039-2057.	2.8	185
8	An adaptive high-dimensional stochastic model representation technique for the solution of stochastic partial differential equations. <i>Journal of Computational Physics</i> , 2010, 229, 3884-3915.	3.8	180
9	Deep Autoregressive Neural Networks for High-Dimensional Inverse Problems in Groundwater Contaminant Source Identification. <i>Water Resources Research</i> , 2019, 55, 3856-3881.	4.2	157
10	Modeling the dynamics of PDE systems with physics-constrained deep auto-regressive networks. <i>Journal of Computational Physics</i> , 2020, 403, 109056.	3.8	140
11	Multi-output separable Gaussian process: Towards an efficient, fully Bayesian paradigm for uncertainty quantification. <i>Journal of Computational Physics</i> , 2013, 241, 212-239.	3.8	124
12	Multi-output local Gaussian process regression: Applications to uncertainty quantification. <i>Journal of Computational Physics</i> , 2012, 231, 5718-5746.	3.8	115
13	An efficient Bayesian inference approach to inverse problems based on an adaptive sparse grid collocation method. <i>Inverse Problems</i> , 2009, 25, 035013.	2.0	111
14	Quantifying model form uncertainty in Reynolds-averaged turbulence models with Bayesian deep neural networks. <i>Journal of Computational Physics</i> , 2019, 383, 125-147.	3.8	78
15	Kernel principal component analysis for stochastic input model generation. <i>Journal of Computational Physics</i> , 2011, 230, 7311-7331.	3.8	74
16	Integration of Adversarial Autoencoders With Residual Dense Convolutional Networks for Estimation of Non-Gaussian Hydraulic Conductivities. <i>Water Resources Research</i> , 2020, 56, e2019WR026082.	4.2	67
17	Stochastic inverse heat conduction using a spectral approach. <i>International Journal for Numerical Methods in Engineering</i> , 2004, 60, 1569-1593.	2.8	61
18	DESIGN OF TWO-DIMENSIONAL STEFAN PROCESSES WITH DESIRED FREEZING FRONT MOTIONS. <i>Numerical Heat Transfer, Part B: Fundamentals</i> , 1992, 21, 307-325.	0.9	53

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19	A non-linear dimension reduction methodology for generating data-driven stochastic input models. <i>Journal of Computational Physics</i> , 2008, 227, 6612-6637.	3.8	50
20	A maximum entropy approach for property prediction of random microstructures. <i>Acta Materialia</i> , 2006, 54, 2265-2276.	7.9	46
21	A stochastic mixed finite element heterogeneous multiscale method for flow in porous media. <i>Journal of Computational Physics</i> , 2011, 230, 4696-4722.	3.8	45
22	Control of the freezing interface motion in two-dimensional solidification processes using the adjoint method. <i>International Journal for Numerical Methods in Engineering</i> , 1995, 38, 63-80.	2.8	44
23	A Bayesian approach to multiscale inverse problems with on-the-fly scale determination. <i>Journal of Computational Physics</i> , 2016, 326, 115-140.	3.8	42
24	An adjoint method for the inverse design of solidification processes with natural convection. <i>International Journal for Numerical Methods in Engineering</i> , 1998, 42, 1121-1144.	2.8	41
25	A computational model for the finite element analysis of thermoplasticity coupled with ductile damage at finite strains. <i>International Journal for Numerical Methods in Engineering</i> , 1999, 45, 1569-1605.	2.8	40
26	A stabilized volume-averaging finite element method for flow in porous media and binary alloy solidification processes. <i>International Journal for Numerical Methods in Engineering</i> , 2004, 60, 1103-1138.	2.8	40
27	A stochastic optimization approach to coarse-graining using a relative-entropy framework. <i>Journal of Chemical Physics</i> , 2013, 138, 044313.	3.0	39
28	Uncertainty propagation using infinite mixture of Gaussian processes and variational Bayesian inference. <i>Journal of Computational Physics</i> , 2015, 284, 291-333.	3.8	39
29	Transformers for modeling physical systems. <i>Neural Networks</i> , 2022, 146, 272-289.	5.9	39
30	Computing property variability of polycrystals induced by grain size and orientation uncertainties. <i>Acta Materialia</i> , 2007, 55, 2279-2290.	7.9	38
31	The effect of multiple sources of uncertainty on the convex hull of material properties of polycrystals. <i>Computational Materials Science</i> , 2009, 47, 342-352.	3.0	34
32	On the solution of an ill-posed design solidification problem using minimization techniques in finite- and infinite-dimensional function spaces. <i>International Journal for Numerical Methods in Engineering</i> , 1993, 36, 3973-3990.	2.8	33
33	Microstructure model reduction and uncertainty quantification in multiscale deformation processes. <i>Computational Materials Science</i> , 2010, 48, 213-227.	3.0	33
34	An object oriented implementation of a front tracking finite element method for directional solidification processes. <i>International Journal for Numerical Methods in Engineering</i> , 1999, 44, 1227-1265.	2.8	32
35	A statistical learning approach for the design of polycrystalline materials. <i>Statistical Analysis and Data Mining</i> , 2009, 1, 306-321.	2.8	29
36	Development of an exchangeâ€“correlation functional with uncertainty quantification capabilities for density functional theory. <i>Journal of Computational Physics</i> , 2016, 311, 173-195.	3.8	29

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37	Predictive coarse-graining. <i>Journal of Computational Physics</i> , 2017, 333, 49-77.	3.8	29
38	Structured Bayesian Gaussian process latent variable model: Applications to data-driven dimensionality reduction and high-dimensional inversion. <i>Journal of Computational Physics</i> , 2019, 383, 166-195.	3.8	29
39	A continuum Lagrangian sensitivity analysis for metal forming processes with applications to die design problems. <i>International Journal for Numerical Methods in Engineering</i> , 2000, 48, 679-720.	2.8	28
40	A continuum sensitivity method for finite thermo-inelastic deformations with applications to the design of hot forming processes. <i>International Journal for Numerical Methods in Engineering</i> , 2002, 55, 1391-1437.	2.8	28
41	A Bayesian approach to multiscale inverse problems using the sequential Monte Carlo method. <i>Inverse Problems</i> , 2011, 27, 105004.	2.0	28
42	Control of the freezing interface morphology in solidification processes in the presence of natural convection. <i>International Journal for Numerical Methods in Engineering</i> , 1995, 38, 1555-1578.	2.8	27
43	DYNAMIC PROGRAMMING APPROACH TO THE INVERSE STEFAN DESIGN PROBLEM. <i>Numerical Heat Transfer, Part B: Fundamentals</i> , 1994, 26, 97-104.	0.9	25
44	Predictive collective variable discovery with deep Bayesian models. <i>Journal of Chemical Physics</i> , 2019, 150, 024109.	3.0	25
45	A least-squares front-tracking finite element method analysis of phase change with natural convection. <i>International Journal for Numerical Methods in Engineering</i> , 1994, 37, 2755-2777.	2.8	24
46	Solving inverse problems using conditional invertible neural networks. <i>Journal of Computational Physics</i> , 2021, 433, 110194.	3.8	24
47	An object-oriented programming approach to the Lagrangian FEM analysis of large inelastic deformations and metal-forming processes. <i>International Journal for Numerical Methods in Engineering</i> , 1999, 45, 399-445.	2.8	23
48	A virtual environment for the interrogation of 3D polycrystalline microstructures including grain size effects. <i>Computational Materials Science</i> , 2009, 44, 1163-1177.	3.0	23
49	Transient dynamic and damping analysis of laminated anisotropic plates using a refined plate theory. <i>International Journal for Numerical Methods in Engineering</i> , 1992, 33, 1059-1080.	2.8	21
50	Multidimensional Adaptive Relevance Vector Machines for Uncertainty Quantification. <i>SIAM Journal of Scientific Computing</i> , 2012, 34, B881-B908.	2.8	21
51	A concurrent model reduction approach on spatial and random domains for the solution of stochastic PDEs. <i>International Journal for Numerical Methods in Engineering</i> , 2006, 66, 1934-1954.	2.8	19
52	Multi-fidelity generative deep learning turbulent flows. , 2020, 2, 391-428.		19
53	An object-oriented framework for the implementation of adjoint techniques in the design and control of complex continuum systems. <i>International Journal for Numerical Methods in Engineering</i> , 2000, 48, 239-266.	2.8	18
54	An updated Lagrangian finite element sensitivity analysis of large deformations using quadrilateral elements. <i>International Journal for Numerical Methods in Engineering</i> , 2001, 52, 1131-1163.	2.8	17

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55	Quantifying uncertainties in first-principles alloy thermodynamics using cluster expansions. <i>Journal of Computational Physics</i> , 2016, 323, 17-44.	3.8	17
56	A probabilistic graphical model approach to stochastic multiscale partial differential equations. <i>Journal of Computational Physics</i> , 2013, 250, 477-510.	3.8	16
57	On the performance of two tangent operators for finite element analysis of large deformation inelastic problems. <i>International Journal for Numerical Methods in Engineering</i> , 1992, 35, 369-389.	2.8	15
58	Computing mechanical response variability of polycrystalline microstructures through dimensionality reduction techniques. <i>Computational Materials Science</i> , 2010, 49, 568-581.	3.0	15
59	A multiscale approach for model reduction of random microstructures. <i>Computational Materials Science</i> , 2012, 63, 269-285.	3.0	12
60	Bayesian multiscale deep generative model for the solution of high-dimensional inverse problems. <i>Journal of Computational Physics</i> , 2022, 455, 111008.	3.8	11
61	Inverse design of directional solidification processes in the presence of a strong external magnetic field. <i>International Journal for Numerical Methods in Engineering</i> , 2001, 50, 2489-2520.	2.8	10
62	Modelling convection in solidification processes using stabilized finite element techniques. <i>International Journal for Numerical Methods in Engineering</i> , 2005, 64, 1769-1799.	2.8	10
63	Relative entropy as model selection tool in cluster expansions. <i>Physical Review B</i> , 2013, 87, .	3.2	10
64	Computationally Efficient Variational Approximations for Bayesian Inverse Problems. <i>Journal of Verification, Validation and Uncertainty Quantification</i> , 2016, 1, .	0.4	10
65	Uncertainty quantification for multiscale disk forging of polycrystal materials using probabilistic graphical model techniques. <i>Computational Materials Science</i> , 2014, 84, 278-292.	3.0	7
66	Efficient data-driven reduced-order models for high-dimensional multiscale dynamical systems. <i>Computer Physics Communications</i> , 2018, 230, 70-88.	7.5	6
67	Inverse Problems in Heat Transfer. , 0, , 523-557.		5
68	Bayesian Uncertainty Propagation Using Gaussian Processes. , 2017, , 555-599.		5
69	Thermal Response Variability of Random Polycrystalline Microstructures. <i>Communications in Computational Physics</i> , 2011, 10, 607-634.	1.7	4
70	A nonparametric belief propagation method for uncertainty quantification with applications to flow in random porous media. <i>Journal of Computational Physics</i> , 2013, 250, 616-643.	3.8	4
71	Pro-ML IDeAS: A Probabilistic Framework for Explicit Inverse Design using Invertible Neural Network. , 2021, , .		4
72	Representation and Classification of Microstructures using Statistical Learning Techniques. <i>AIP Conference Proceedings</i> , 2004, , .	0.4	3

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73	Adaptive Locally Weighted Projection Regression Method for Uncertainty Quantification. Communications in Computational Physics, 2013, 14, 851-878.	1.7	3
74	A Bayesian multiscale deep learning framework for flows in random media. , 2021, 3, 251.		3
75	A continuum Lagrangian sensitivity analysis for metal forming processes with applications to die design problems. International Journal for Numerical Methods in Engineering, 2000, 48, 679-720.	2.8	2
76	A gradient optimization method for efficient design of three-dimensional deformation processes. AIP Conference Proceedings, 2004, , .	0.4	1
77	Multi-length scale design of deformation processes for control of orientation (texture) dependent properties. AIP Conference Proceedings, 2004, , .	0.4	1
78	Parallel probabilistic graphical model approach for nonparametric Bayesian inference. Journal of Computational Physics, 2018, 372, 546-563.	3.8	1