Hari S Viswanathan

List of Publications by Year
in descending order

106 papers	6,405 citations	61984 43 h-index	69250 77 g-index
114 all docs	114 docs citations	114 times ranked	4541 citing authors

#	Article	IF	Citations
1	Shale gas and non-aqueous fracturing fluids: Opportunities and challenges for supercritical CO2. Applied Energy, 2015, 147, 500-509.	10.1	622
2	An Integrated Framework for Optimizing CO₂ Sequestration and Enhanced Oil Recovery. Environmental Science and Technology Letters, 2014, 1, 49-54.	8.7	280
3	dfnWorks: A discrete fracture network framework for modeling subsurface flow and transport. Computers and Geosciences, 2015, 84, 10-19.	4.2	264
4	The shale gas revolution: Barriers, sustainability, and emerging opportunities. Applied Energy, 2017, 199, 88-95.	10.1	242
5	CO₂ Accounting and Risk Analysis for CO₂ Sequestration at Enhanced Oil Recovery Sites. Environmental Science & Technology, 2016, 50, 7546-7554.	10.0	228
6	Nanoscale simulation of shale transport properties using the lattice Boltzmann method: permeability and diffusivity. Scientific Reports, 2015, 5, 8089.	3.3	206
7	Pore Scale Modeling of Reactive Transport Involved in Geologic CO2 Sequestration. Transport in Porous Media, 2010, 82, 197-213.	2.6	166
8	Why Fracking Works. Journal of Applied Mechanics, Transactions ASME, 2014, 81, .	2.2	147
9	Development of a Hybrid Process and System Model for the Assessment of Wellbore Leakage at a Geologic CO₂ Sequestration Site. Environmental Science & Technology, 2008, 42, 7280-7286.	10.0	137
10	The cross-scale science of CO2 capture and storage: from pore scale to regional scale. Energy and Environmental Science, 2012, 5, 7328.	30.8	132
11	Pore-scale study of dissolution-induced changes in permeability and porosity of porous media. Journal of Hydrology, 2014, 517, 1049-1055.	5.4	130
12	CO2 as a fracturing fluid: Potential for commercial-scale shale gas production and CO2 sequestration. Energy Procedia, 2014, 63, 7780-7784.	1.8	128
13	Hydraulic fracturing fluid migration in the subsurface: A review and expanded modeling results. Water Resources Research, 2015, 51, 7159-7188.	4.2	121
14	A System Model for Geologic Sequestration of Carbon Dioxide. Environmental Science & Technology, 2009, 43, 565-570.	10.0	117
15	Fracture-permeability behavior of shale. Journal of Unconventional Oil and Gas Resources, 2015, 11, 27-43.	3.5	117
16	Effectiveness of supercritical-CO2 and N2 huff-and-puff methods of enhanced oil recovery in shale fracture networks using microfluidic experiments. Applied Energy, 2018, 230, 160-174.	10.1	116
17	Greening Coal: Breakthroughs and Challenges in Carbon Capture and Storage. Environmental Science & Technology, 2011, 45, 8597-8604.	10.0	110
18	The Effect of Wettability Heterogeneity on Relative Permeability of Twoâ€Phase Flow in Porous Media: A Lattice Boltzmann Study. Water Resources Research, 2018, 54, 1295-1311.	4.2	104

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19	Generalized lattice Boltzmann model for flow through tight porous media with Klinkenberg's effect. Physical Review E, 2015, 91, 033004.	2.1	96
20	Understanding hydraulic fracturing: a multi-scale problem. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2016, 374, 20150426.	3.4	92
21	Poreâ€scale study of dissolutionâ€induced changes in hydrologic properties of rocks with binary minerals. Water Resources Research, 2014, 50, 9343-9365.	4.2	91
22	Permeability prediction of shale matrix reconstructed using the elementary building block model. Fuel, 2015, 160, 346-356.	6.4	89
23	Geo-material microfluidics at reservoir conditions for subsurface energy resource applications. Lab on A Chip, 2015, 15, 4044-4053.	6.0	87
24	Reactive chemical transport simulations of geologic carbon sequestration: Methods and applications. Earth-Science Reviews, 2020, 208, 103265.	9.1	86
25	Effect of advective flow in fractures and matrix diffusion on natural gas production. Water Resources Research, 2015, 51, 8646-8657.	4.2	85
26	A reactive transport model of neptunium migration from the potential repository at Yucca Mountain. Journal of Hydrology, 1998, 209, 251-280.	5.4	84
27	Uncertainty analysis of carbon sequestration in an active CO2-EOR field. International Journal of Greenhouse Gas Control, 2016, 51, 18-28.	4.6	81
28	Evaluating the effect of internal aperture variability on transport in kilometer scale discrete fracture networks. Advances in Water Resources, 2016, 94, 486-497.	3.8	75
29	Probabilistic evaluation of shallow groundwater resources at a hypothetical carbon sequestration site. Scientific Reports, 2014, 4, 4006.	3.3	74
30	A comparative study of discrete fracture network and equivalent continuum models for simulating flow and transport in the far field of a hypothetical nuclear waste repository in crystalline host rock. Journal of Hydrology, 2017, 553, 59-70.	5.4	70
31	Developing a robust geochemical and reactive transport model to evaluate possible sources of arsenic at the CO2 sequestration natural analog site in Chimayo, New Mexico. International Journal of Greenhouse Gas Control, 2012, 10, 199-214.	4.6	69
32	Uncertainty Quantification for CO2 Sequestration and Enhanced Oil Recovery. Energy Procedia, 2014, 63, 7685-7693.	1.8	69
33	Predictive modeling of dynamic fracture growth in brittle materials with machine learning. Computational Materials Science, 2018, 148, 46-53.	3.0	66
34	Effects of geologic reservoir uncertainty on CO2 transport and storage infrastructure. International Journal of Greenhouse Gas Control, 2012, 8, 132-142.	4.6	65
35	From Fluid Flow to Coupled Processes in Fractured Rock: Recent Advances and New Frontiers. Reviews of Geophysics, 2022, 60, e2021RG000744.	23.0	61
36	CO2 leakage impacts on shallow groundwater: Field-scale reactive-transport simulations informed by observations at a natural analog site. Applied Geochemistry, 2013, 30, 136-147.	3.0	60

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37	Learning to fail: Predicting fracture evolution in brittle material models using recurrent graph convolutional neural networks. Computational Materials Science, 2019, 162, 322-332.	3.0	58
38	CO₂/Brine Transport into Shallow Aquifers along Fault Zones. Environmental Science & Technology, 2013, 47, 290-297.	10.0	52
39	Highâ€stress triaxial directâ€shear fracturing of Utica shale and in situ Xâ€ray microtomography with permeability measurement. Journal of Geophysical Research: Solid Earth, 2016, 121, 5493-5508.	3.4	51
40	Machine learning for graph-based representations of three-dimensional discrete fracture networks. Computational Geosciences, 2018, 22, 695-710.	2.4	49
41	Branching of hydraulic cracks enabling permeability of gas or oil shale with closed natural fractures. Proceedings of the National Academy of Sciences of the United States of America, 2019, 116, 1532-1537.	7.1	49
42	Where Does Water Go During Hydraulic Fracturing?. Ground Water, 2016, 54, 488-497.	1.3	48
43	Predictions of first passage times in sparse discrete fracture networks using graph-based reductions. Physical Review E, 2017, 96, 013304.	2.1	46
44	A framework for data-driven solution and parameter estimation of PDEs using conditional generative adversarial networks. Nature Computational Science, 2021, 1, 819-829.	8.0	44
45	Mesoscale Carbon Sequestration Site Screening and CCS Infrastructure Analysis. Environmental Science & Technology, 2011, 45, 215-222.	10.0	42
46	Modeling flow and transport in fracture networks using graphs. Physical Review E, 2018, 97, 033304.	2.1	41
47	Efficient numerical techniques for modeling multicomponent ground-water transport based upon simultaneous solution of strongly coupled subsets of chemical components. Advances in Water Resources, 2000, 23, 307-324.	3.8	39
48	Mixing in a threeâ€phase system: Enhanced production of oilâ€wet reservoirs by CO₂ injection. Geophysical Research Letters, 2016, 43, 196-205.	4.0	38
49	Quantifying Topological Uncertainty in Fractured Systems using Graph Theory and Machine Learning. Scientific Reports, 2018, 8, 11665.	3.3	38
50	Advancing Graphâ€Based Algorithms for Predicting Flow and Transport in Fractured Rock. Water Resources Research, 2018, 54, 6085-6099.	4.2	37
51	Simulation of discrete cracks driven by nearly incompressible fluid via 2D combined finiteâ€discrete element method. International Journal for Numerical and Analytical Methods in Geomechanics, 2019, 43, 1724-1743.	3.3	36
52	Inertial Effects During the Process of Supercritical CO₂ Displacing Brine in a Sandstone: Lattice Boltzmann Simulations Based on the Continuumâ€Surfaceâ€Force and Geometrical Wetting Models. Water Resources Research, 2019, 55, 11144-11165.	4.2	36
53	Quantification of CO2-cement-rock interactions at the well-caprock-reservoir interface and implications for geological CO2 storage. International Journal of Greenhouse Gas Control, 2017, 63, 126-140.	4.6	35
54	Proppant placement in complex fracture geometries: A computational fluid dynamics study. Journal of Natural Gas Science and Engineering, 2020, 79, 103295.	4.4	35

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55	Analysis and Visualization of Discrete Fracture Networks Using a Flow Topology Graph. IEEE Transactions on Visualization and Computer Graphics, 2017, 23, 1896-1909.	4.4	34
56	Identifying Backbones in Three-Dimensional Discrete Fracture Networks: A Bipartite Graph-Based Approach. Multiscale Modeling and Simulation, 2018, 16, 1948-1968.	1.6	34
57	Reduced-order modeling through machine learning and graph-theoretic approaches for brittle fracture applications. Computational Materials Science, 2019, 157, 87-98.	3.0	33
58	The challenge of predicting groundwater quality impacts in a CO2 leakage scenario: Results from field, laboratory, and modeling studies at a natural analog site in New Mexico, USA. Energy Procedia, 2011, 4, 3239-3245.	1.8	31
59	Caprock integrity susceptibility to permeable fracture creation. International Journal of Greenhouse Gas Control, 2017, 64, 60-72.	4.6	31
60	Experimental investigation on oil migration and accumulation in tight sandstones. Journal of Petroleum Science and Engineering, 2018, 160, 267-275.	4.2	31
61	Relative stability and significance of dawsonite and aluminum minerals in geologic carbon sequestration. Geophysical Research Letters, 2011, 38, n/a-n/a.	4.0	30
62	How storage uncertainty will drive CCS infrastructure. Energy Procedia, 2011, 4, 2393-2400.	1.8	30
63	Matrix Diffusion in Fractured Media: New Insights Into Power Law Scaling of Breakthrough Curves. Geophysical Research Letters, 2019, 46, 13785-13795.	4.0	30
64	Generalized dual porosity: A numerical method for representing spatially variable sub-grid scale processes. Advances in Water Resources, 2008, 31, 535-544.	3.8	27
65	Efficient Monte Carlo With Graphâ€Based Subsurface Flow and Transport Models. Water Resources Research, 2018, 54, 3758-3766.	4.2	27
66	Model reduction for fractured porous media: a machine learning approach for identifying main flow pathways. Computational Geosciences, 2019, 23, 617-629.	2.4	26
67	Reduced methane recovery at high pressure due to methane trapping in shale nanopores. Communications Earth & Environment, 2020, 1, .	6.8	26
68	Modeling Nanoconfinement Effects Using Active Learning. Journal of Physical Chemistry C, 2020, 124, 22200-22211.	3.1	24
69	Modeling and scale-bridging using machine learning: nanoconfinement effects in porous media. Scientific Reports, 2020, 10, 13312.	3.3	24
70	CO2 Sequestration and Enhanced Oil Recovery at Depleted Oil/Gas Reservoirs. Energy Procedia, 2017, 114, 6957-6967.	1.8	23
71	Crustal fingering facilitates free-gas methane migration through the hydrate stability zone. Proceedings of the National Academy of Sciences of the United States of America, 2020, 117, 31660-31664.	7.1	22
72	Homogenization of Dissolution and Enhanced Precipitation Induced by Bubbles in Multiphase Flow Systems. Geophysical Research Letters, 2020, 47, e2020GL087163.	4.0	21

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73	A physics-informed and hierarchically regularized data-driven model for predicting fluid flow through porous media. Journal of Computational Physics, 2021, 443, 110526.	3.8	21
74	A machine learning framework for rapid forecasting and history matching in unconventional reservoirs. Scientific Reports, 2021, 11, 21730.	3.3	21
75	Regression-based reduced-order models to predict transient thermal output for enhanced geothermal systems. Geothermics, 2017, 70, 192-205.	3.4	20
76	Scaleâ€Bridging in Threeâ€Dimensional Fracture Networks: Characterizing the Effects of Variable Fracture Apertures on Networkâ€Scale Flow Channelization. Geophysical Research Letters, 2021, 48, e2021GL094400.	4.0	18
77	Robust system size reduction of discrete fracture networks: a multi-fidelity method that preserves transport characteristics. Computational Geosciences, 2018, 22, 1515-1526.	2.4	17
78	Great SCOT! Rapid tool for carbon sequestration science, engineering, and economics. Applied Computing and Geosciences, 2020, 7, 100035.	2.2	17
79	Arsenic mobilization in shallow aquifers due to CO2 and brine intrusion from storage reservoirs. Scientific Reports, 2017, 7, 2763.	3.3	16
80	Immobile Pore-Water Storage Enhancement and Retardation of Gas Transport in Fractured Rock. Transport in Porous Media, 2018, 124, 369-394.	2.6	16
81	Frankensteinâ€™s ROMster: Avoiding pitfalls of reduced-order model development. International Journal of Greenhouse Gas Control, 2020, 93, 102892.	4.6	16
82	Reactive transport modeling of arsenic mobilization in shallow groundwater: impacts of CO2 and brine leakage. Geomechanics and Geophysics for Geo-Energy and Geo-Resources, 2017, 3, 339-350.	2.9	15
83	The mechanisms, dynamics, and implications of self-sealing and CO2 resistance in wellbore cements. International Journal of Greenhouse Gas Control, 2018, 75, 162-179.	4.6	15
84	Chemical Impacts of Potential CO2 and Brine Leakage on Groundwater Quality with Quantitative Risk Assessment: A Case Study of the Farnsworth Unit. Energies, 2020, 13, 6574.	3.1	14
85	A colloid-facilitated transport model with variable colloid transport properties. Geophysical Research Letters, 2007, 34, .	4.0	13
86	Role of interaction between hydraulic and natural fractures on production. Journal of Natural Gas Science and Engineering, 2020, 82, 103451.	4.4	12
87	Molecular Modeling of Subsurface Phenomena Related to Petroleum Engineering. Energy & Fuels, 2021, 35, 2851-2869.	5.1	12
88	Discontinuities in effective permeability due to fracture percolation. Mechanics of Materials, 2018, 119, 25-33.	3.2	11
89	Surrogate Models for Estimating Failure in Brittle and Quasi-Brittle Materials. Applied Sciences (Switzerland), 2019, 9, 2706.	2.5	11
90	A geostatistical modeling study of the effect of heterogeneity on radionuclide transport in the unsaturated zone, Yucca Mountain. Journal of Contaminant Hydrology, 2003, 62-63, 319-336.	3.3	10

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91	Application of the CO2 -PENS risk analysis tool to the Rock Springs Uplift, Wyoming. Energy Procedia, 2011, 4, 4084-4091.	1.8	10
92	Extracting Hydrocarbon From Shale: An Investigation of the Factors That Influence the Decline and the Tail of the Production Curve. Water Resources Research, 2018, 54, 3748-3757.	4.2	9
93	3D particle transport in multichannel microfluidic networks with rough surfaces. Scientific Reports, 2020, 10, 13848.	3.3	8
94	Towards real-time forecasting of natural gas production by harnessing graph theory for stochastic discrete fracture networks. Journal of Petroleum Science and Engineering, 2020, 195, 107791.	4.2	8
95	Machine learning techniques for fractured media. Advances in Geophysics, 2020, 61, 109-150.	2.8	8
96	Comparison of streamtube and three-dimensional models of reactive transport in heterogeneous media. Journal of Hydraulic Research/De Recherches Hydrauliques, 2004, 42, 141-145.	1.7	7
97	Physics-informed machine learning for backbone identification in discrete fracture networks. Computational Geosciences, 2020, 24, 1429-1444.	2.4	6
98	Risk Assessment and Management Workflowâ€"An Example of the Southwest Regional Partnership. Energies, 2021, 14, 1908.	3.1	6
99	Molecular-Scale Considerations of Enhanced Oil Recovery in Shale. Energies, 2020, 13, 6619.	3.1	5
100	Modeling CO 2 plume migration using an invasionâ€percolation approach that includes dissolution. , 2020, 10, 283-295.		5
101	Transient flow modeling in fractured media using graphs. Physical Review E, 2020, 102, 052310.	2.1	4
102	Injection Parameters That Promote Branching of Hydraulic Cracks. Geophysical Research Letters, 2021, 48, e2021GL093321.	4.0	4
103	Reactive Transport Modeling of Geological Carbon Storage Associated With CO2 and Brine Leakage. , 2019, , 89-116.		3
104	Introduction: energy and the subsurface. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2016, 374, 20150430.	3.4	1
105	Complex Fracture Depletion Model for Reserves Estimations in Shale. Journal of Energy Resources Technology, Transactions of the ASME, 2021, 143, .	2.3	1
106	Using Discovery Science To Increase Efficiency of Hydraulic Fracturing While Reducing Water Usage. ACS Symposium Series, 2015, , 71-88.	0.5	0