Jan M Nordbotten

List of Publications by Year
in descending order

151 papers	6,289 citations	76326 40 h-index	76900 74 g-index
167 all docs	167 docs citations	167 times ranked	3304 citing authors

#	Article	IF	Citations
1	Injection and Storage of CO2 in Deep Saline Aquifers: Analytical Solution for CO2 Plume Evolution During Injection. Transport in Porous Media, 2005, 58, 339-360.	2.6	483
2	A benchmark study on problems related to CO2 storage in geologic formations. Computational Geosciences, 2009, 13, 409-434.	2.4	348
3	Semianalytical Solution for CO2 Leakage through an Abandoned Well. Environmental Science & Technology, 2005, 39, 602-611.	10.0	276
4	Similarity solutions for fluid injection into confined aquifers. Journal of Fluid Mechanics, 2006, 561, 307.	3.4	230
5	An efficient multi-point flux approximation method for Discrete Fracture–Matrix simulations. Journal of Computational Physics, 2012, 231, 3784-3800.	3.8	227
6	Status of CO_2 storage in deep saline aquifers with emphasis on modeling approaches and practical simulations. Water Resources Research, 2015, 51, 6846-6892.	4.2	216
7	Model for CO_2 Leakage Including Multiple Geological Layers and Multiple Leaky Wells. Environmental Science & Technology, 2009, 43, 743-749.	10.0	188
8	A compact multipoint flux approximation method with improved robustness. Numerical Methods for Partial Differential Equations, 2008, 24, 1329-1360.	3.6	175
9	Analytical solutions for leakage rates through abandoned wells. Water Resources Research, 2004, 40, .	4.2	169
10	Monotonicity of control volume methods. Numerische Mathematik, 2007, 106, 255-288.	1.9	161
11	Practical Modeling Approaches for Geological Storage of Carbon Dioxide. Ground Water, 2009, 47, 627-638.	1.3	156
12	High-accuracy phase-field models for brittle fracture based on a new family of degradation functions. Journal of the Mechanics and Physics of Solids, 2018, 111, 458-489.	4.8	140
13	Field-scale application of a semi-analytical model for estimation of CO2 and brine leakage along old wells. International Journal of Greenhouse Gas Control, 2011, 5, 257-269.	4.6	127
14	Vertical equilibrium with sub-scale analytical methods for geological CO2 sequestration. Computational Geosciences, 2009, 13, 469-481.	2.4	109
15	Vertically averaged approaches for CO_2 migration with solubility trapping. Water Resources Research, 2011, 47, .	4.2	106
16	Robust Discretization of Flow in Fractured Porous Media. SIAM Journal on Numerical Analysis, 2018, 56, 2203-2233.	2.3	91
17	Uncertainties in practical simulation of CO2 storage. International Journal of Greenhouse Gas Control, 2012, 9, 234-242.	4.6	84
18	Robust fixed stress splitting for Biot's equations in heterogeneous media. Applied Mathematics Letters, 2017, 68, 101-108.	2.7	83

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19	Numerical Simulation Studies of the Long-term Evolution of a CO2 Plume in a Saline Aquifer with a Sloping Caprock. Transport in Porous Media, 2011, 90, 135-151.	2.6	82
20	Impact of the capillary fringe in vertically integrated models for CO_2 storage. Water Resources Research, 2011, 47, .	4.2	80
21	Discretization on quadrilateral grids with improved monotonicity properties. Journal of Computational Physics, 2005, 203, 744-760.	3.8	68
22	Monotonicity conditions for control volume methods on uniform parallelogram grids in homogeneous media. Computational Geosciences, 2005, 9, 61-72.	2.4	68
23	An ecohydrological approach to predicting regional woody species distribution patterns in dryland ecosystems. Advances in Water Resources, 2010, 33, 215-230.	3.8	68
24	Field-case simulation of CO2 -plume migration using vertical-equilibrium models. Energy Procedia, 2011, 4, 3801-3808.	1.8	68
25	Stable Cell-Centered Finite Volume Discretization for Biot Equations. SIAM Journal on Numerical Analysis, 2016, 54, 942-968.	2.3	68
26	Applicability of vertical-equilibrium and sharp-interface assumptions in CO2 sequestration modeling. International Journal of Greenhouse Gas Control, 2012, 10, 134-147.	4.6	66
27	Unified approach to discretization of flow in fractured porous media. Computational Geosciences, 2019, 23, 225-237.	2.4	62
28	On the relationship between the multiscale finite-volume method and domain decomposition preconditioners. Computational Geosciences, 2008, 12, 367-376.	2.4	59
29	Cellâ€‚centered finite volume discretizations for deformable porous media. International Journal for Numerical Methods in Engineering, 2014, 100, 399-418.	2.8	58
30	Application of simplified models to CO2 migration and immobilization in large-scale geological systems. International Journal of Greenhouse Gas Control, 2012, 9, 72-84.	4.6	57
31	A robust linearization scheme for finite volume based discretizations for simulation of two-phase flow in porous media. Journal of Computational and Applied Mathematics, 2015, 289, 134-141.	2.0	57
32	Finite volume methods for elasticity with weak symmetry. International Journal for Numerical Methods in Engineering, 2017, 112, 939-962.	2.8	57
33	Effects of a capillary transition zone on the stability of a diffusive boundary layer. IMA Journal of Applied Mathematics, 2012, 77, 771-787.	1.6	56
34	Detecting leakage of brine or CO2 through abandoned wells in a geological sequestration operation using pressure monitoring wells. Energy Procedia, 2011, 4, 3620-3627.	1.8	55
35	Domain decomposition strategies for nonlinear flow problems in porous media. Journal of Computational Physics, 2013, 234, 439-451.	3.8	50
36	Risk of Leakage versus Depth of Injection in Geological Storage. Energy Procedia, 2009, 1, 2573-2580.	1.8	49

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37	An improved analytical solution for interface upconing around a well. Water Resources Research, 2006, 42, .	4.2	48
38	Convergence of a Cell-Centered Finite Volume Discretization for Linear Elasticity. SIAM Journal on Numerical Analysis, 2015, 53, 2605-2625.	2.3	44
39	Sufficient criteria are necessary for monotone control volume methods. Applied Mathematics Letters, 2009, 22, 1178-1180.	2.7	43
40	Initial evaluation of advantageous synergies associated with simultaneous brine production and CO2 geological sequestration. International Journal of Greenhouse Gas Control, 2012, 8, 90-100.	4.6	43
41	Finite volume discretization for poroelastic media with fractures modeled by contact mechanics. International Journal for Numerical Methods in Engineering, 2020, 121, 644-663.	2.8	43
42	Anderson accelerated fixed-stress splitting schemes for consolidation of unsaturated porous media. Computers and Mathematics With Applications, 2019, 77, 1479-1502.	2.7	42
43	Robust iterative schemes for non-linear poromechanics. Computational Geosciences, 2018, 22, 1021-1038.	2.4	40
44	Determining effective wellbore permeability from a field pressure test: a numerical analysis of detection limits. Environmental Geology, 2008, 54, 1207-1215.	1.2	39
45	Evaluation of the spread of acid-gas plumes injected in deep saline aquifers in western Canada as an analogue for CO2 injection into continental sedimentary basins. , 2005, , 479-487.		38
46	Interpretation of macroscale variables in Darcy's law. Water Resources Research, 2007, 43, .	4.2	37
47	A robust, mass conservative scheme for two-phase flow in porous media including Hölder continuous nonlinearities. IMA Journal of Numerical Analysis, 2018, 38, 884-920.	2.9	37
48	A methodology to estimate maximum probable leakage along old wells in a geological sequestration operation. International Journal of Greenhouse Gas Control, 2012, 7, 39-47.	4.6	36
49	On the definition of macroscale pressure for multiphase flow in porous media. Water Resources Research, 2008, 44, .	4.2	35
50	Impact of top-surface morphology on CO2 storage capacity. International Journal of Greenhouse Gas Control, 2012, 11, 221-235.	4.6	34
51	A New Finite-Volume Approach to Efficient Discretization on Challenging Grids. SPE Journal, 2010, 15, 658-669.	3.1	32
52	Active and integrated management of water resources throughout CO2 capture and sequestration operations. Energy Procedia, 2011, 4, 4221-4229.	1.8	31
53	On the optimization of the fixed-stress splitting for Biot's equations. International Journal for Numerical Methods in Engineering, 2019, 120, 179-194.	2.8	31
54	Impact of capillary hysteresis and trapping on vertically integrated models for CO2 storage. Advances in Water Resources, 2013, 62, 465-474.	3.8	30

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55	Convective mixing influenced by the capillary transition zone. Computational Geosciences, 2014, 18, 417-431.	2.4	30
56	Effect of Mean Network Coordination Number on Dispersivity Characteristics. Transport in Porous Media, 2012, 95, 447-463.	2.6	28
57	Efficient simulation of geothermal processes in heterogeneous porous media based on the exponential Rosenbrock–Euler and Rosenbrock-type methods. Advances in Water Resources, 2013, 53, 250-262.	3.8	27
58	Finite volume hydromechanical simulation in porous media. Water Resources Research, 2014, 50, 4379-4394.	4.2	27
59	Asymmetric ecological conditions favor Red-Queen type of continued evolution over stasis. Proceedings of the National Academy of Sciences of the United States of America, 2016, 113, 1847-1852.	7.1	26
60	Adaptive Variational Multiscale Methods for Multiphase Flow in Porous Media. Multiscale Modeling and Simulation, 2009, 7, 1455-1473.	1.6	25
61	An ecohydrological approach to predicting hillslope‐scale vegetation patterns in dryland ecosystems. Water Resources Research, 2012, 48, .	4.2	25
62	An accelerated staggered scheme for variational phase-field models of brittle fracture. Computer Methods in Applied Mechanics and Engineering, 2021, 381, 113822.	6.6	25
63	How simple can we make models for CO_2 injection, migration, and leakage?. Energy Procedia, 2011, 4, 3857-3864.	1.8	24
64	Comparison between cell-centered and nodal-based discretization schemes for linear elasticity. Computational Geosciences, 2018, 22, 233-260.	2.4	24
65	A new framework for assessing subject-specific whole brain circulation and perfusion using MRI-based measurements and a multi-scale continuous flow model. PLoS Computational Biology, 2019, 15, e1007073.	3.2	24
66	A singularity removal method for coupled 1D–3D flow models. Computational Geosciences, 2020, 24, 443-457.	2.4	22
67	Upslope plume migration and implications for geological CO_2 sequestration in deep, saline aquifers. IES Journal Part A: Civil and Structural Engineering, 2008, 1, 2-16.	0.4	21
68	Modeling and Simulation of Microbial Enhanced Oil Recovery Including Interfacial Area. Transport in Porous Media, 2017, 120, 395-413.	2.6	21
69	Adaptive poromechanics computations based on a posteriori error estimates for fully mixed formulations of Biot's consolidation model. Computer Methods in Applied Mechanics and Engineering, 2019, 347, 264-294.	6.6	21
70	Estimating effective rates of convective mixing from commercial-scale injection. Environmental Earth Sciences, 2012, 67, 527-535.	2.7	20
71	A multiscale multilayer vertically integrated model with vertical dynamics for CO_2 sequestration in layered geological formations. Water Resources Research, 2016, 52, 6490-6505.	4.2	20
72	A 3-D numerical model of the influence of meanders on groundwater discharge to a gaining stream in an unconfined sandy aquifer. Journal of Hydrology, 2017, 552, 168-181.	5.4	20

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73	Linear and nonlinear convection in porous media between coaxial cylinders. Physics of Fluids, 2011, 23, .	4.0	19
74	A finite-volume discretization for deformation of fractured media. Computational Geosciences, 2018, 22, 993-1007.	2.4	19
75	Adaptive asynchronous time-stepping, stopping criteria, and a posteriori error estimates for fixed-stress iterative schemes for coupled poromechanics problems. Journal of Computational and Applied Mathematics, 2020, 364, 112312.	2.0	19
76	An iterative staggered scheme for phase field brittle fracture propagation with stabilizing parameters. Computer Methods in Applied Mechanics and Engineering, 2020, 361, 112752.	6.6	18
77	Monolithic and splitting solution schemes for fully coupled quasi-static thermo-poroelasticity with nonlinear convective transport. Computers and Mathematics With Applications, 2020, 80, 1964-1984.	2.7	18
78	Inverse Scale Spaces for Nonlinear Regularization. Journal of Mathematical Imaging and Vision, 2007, 27, 41-50.	1.3	17
79	Splitting method for elliptic equations with line sources. ESAIM: Mathematical Modelling and Numerical Analysis, 2019, 53, 1715-1739.	1.9	17
80	*In Vivo* Detection of Chronic Kidney Disease Using Tissue Deformation Fields From Dynamic MR Imaging. IEEE Transactions on Biomedical Engineering, 2019, 66, 1779-1790.	4.2	17
81	Hydrologic variability and its influence on long€term peat dynamics. Water Resources Research, 2010, 46, .	4.2	16
82	Physics-based preconditioners for flow in fractured porous media. Water Resources Research, 2014, 50, 1357-1373.	4.2	16
83	Vertically integrated models for coupled two€phase flow and geomechanics in porous media. Water Resources Research, 2016, 52, 1398-1417.	4.2	16
84	Analysis of Control Volume Heterogeneous Multiscale Methods for Single Phase Flow in Porous Media. Multiscale Modeling and Simulation, 2014, 12, 335-363.	1.6	15
85	Analytical solutions for two€phase subsurface flow to a leaky fault considering vertical flow effects and fault properties. Water Resources Research, 2014, 50, 3536-3552.	4.2	15
86	Functional analysis and exterior calculus on mixed-dimensional geometries. Annali Di Matematica Pura Ed Applicata, 2021, 200, 757-789.	1.0	15
87	A Multipoint Stress Mixed Finite Element Method for Elasticity on Simplicial Grids. SIAM Journal on Numerical Analysis, 2020, 58, 630-656.	2.3	14
88	Well-posedness of the fully coupled quasi-static thermo-poroelastic equations with nonlinear convective transport. Journal of Mathematical Analysis and Applications, 2019, 471, 239-266.	1.0	13
89	Stochastic coupling of rainfall and biomass dynamics. Water Resources Research, 2007, 43, .	4.2	12
90	Multiscale mass conservative domain decomposition preconditioners for elliptic problems on irregular grids. Computational Geosciences, 2011, 15, 587-602.	2.4	12

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91	An efficient software framework for performing industrial risk assessment of leakage for geological storage of CO2. Energy Procedia, 2011, 4, 4207-4214.	1.8	12
92	Instant convolution shadows for volumetric detail mapping. ACM Transactions on Graphics, 2013, 32, 1-18.	7.2	12
93	Hysteretic upscaled constitutive relationships for vertically integrated porous media flow. Computing and Visualization in Science, 2012, 15, 147-161.	1.2	11
94	Plant biomass and soil moisture dynamics: analytical results. Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 2015, 471, 20150179.	2.1	11
95	Two-Scale Preconditioning for Two-Phase Nonlinear Flows in Porous Media. Transport in Porous Media, 2016, 114, 485-503.	2.6	11
96	Heterogeneity preserving upscaling for heat transport in fractured geothermal reservoirs. Computational Geosciences, 2018, 22, 451-467.	2.4	11
97	Upscaling of the Coupling of Hydromechanical and Thermal Processes in a Quasi-static Poroelastic Medium. Transport in Porous Media, 2018, 124, 137-158.	2.6	11
98	A New Finite-Volume Approach to Efficient Discretization on Challenging Grids. , 2007, , .		10
99	The impact of local-scale processes on large-scale CO2 migration and immobilization. Energy Procedia, 2011, 4, 3896-3903.	1.8	10
100	Physical Models for Simulation and Reconstruction of Human Tissue Deformation Fields in Dynamic MRI. IEEE Transactions on Biomedical Engineering, 2016, 63, 2200-2210.	4.2	10
101	Ecological and evolutionary dynamics of interconnectedness and modularity. Proceedings of the National Academy of Sciences of the United States of America, 2018, 115, 750-755.	7.1	10
102	Analytical solutions for aquifer thermal energy storage. Water Resources Research, 2017, 53, 1354-1368.	4.2	9
103	A combined finite element–finite volume framework for phase-field fracture. Computer Methods in Applied Mechanics and Engineering, 2021, 373, 113474.	6.6	9
104	Auxiliary variables for 3D multiscale simulations in heterogeneous porous media. Journal of Computational Physics, 2013, 238, 141-153.	3.8	8
105	Influence of natural convection in a porous medium when producing from borehole heat exchangers. Water Resources Research, 2013, 49, 4927-4938.	4.2	8
106	An Introduction to Multi-point Flux (MPFA) and Stress (MPSA) Finite Volume Methods for Thermo-poroelasticity. SEMA SIMAI Springer Series, 2021, , 119-158.	0.7	8
107	A Posteriori Error Estimates for Approximate Solutions of the Barenblatt-Biot Poroelastic Model. Computational Methods in Applied Mathematics, 2010, 10, 302-314.	0.8	7
108	Full Pressure Coupling for Geo-mechanical Multi-phase Multi-component Flow Simulations. , 2015, , .		7

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109	The dynamics of trait variance in multi-species communities. Royal Society Open Science, 2020, 7, 200321.	2.4	7
110	Rayleigh–Taylor instability of immiscible fluids in porous media. Continuum Mechanics and Thermodynamics, 2016, 28, 721-731.	2.2	6
111	Iterative solvers for Biot model under small and large deformations. Computational Geosciences, 2021, 25, 687-699.	2.4	6
112	Modeling, Structure and Discretization of Hierarchical Mixed-Dimensional Partial Differential Equations. Lecture Notes in Computational Science and Engineering, 2018, , 87-101.	0.3	6
113	Non-uniqueness of evapotranspiration due to spatial heterogeneity of plant species. Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 2006, 462, 2359-2371.	2.1	5
114	Appropriate Choice of Average Pressure for Upscaling Relative Permeability in Dynamic Flow Conditions. SPE Journal, 2010, 15, 228-237.	3.1	5
115	Quantifying Transient Soil Moisture Dynamics Using Multipoint Direct–Current Resistivity in Homogeneous Sand. Vadose Zone Journal, 2011, 10, 286-298.	2.2	5
116	SUCCESS: SUbsurface CO2 storage–Critical elements and superior strategy. Energy Procedia, 2011, 4, 6117-6124.	1.8	5
117	Inexact linear solvers for control volume discretizations in porous media. Computational Geosciences, 2015, 19, 159-176.	2.4	5
118	Non-standard shocks in the Buckley–Leverett equation. Journal of Mathematical Analysis and Applications, 2015, 428, 882-895.	1.0	5
119	On reproducing uniform flow exactly on general hexahedral cells using one degree of freedom per surface. Advances in Water Resources, 2009, 32, 264-267.	3.8	4
120	Iterative Methods for Coupled Flow and Geomechanics in Unsaturated Porous Media. , 2017, , .		4
121	Guaranteed and computable error bounds for approximations constructed by an iterative decoupling of the Biot problem. Computers and Mathematics With Applications, 2021, 91, 122-149.	2.7	4
122	A nonlinear multi-scale model for blood circulation in a realistic vascular system. Royal Society Open Science, 2021, 8, 201949.	2.4	4
123	Capturing the coupled hydro-mechanical processes occurring during CO2 injection – example from In Salah. Energy Procedia, 2014, 63, 3416-3424.	1.8	3
124	Dynamics of the interface between immiscible liquids of different densities with low Froude number. Nonlinear Analysis: Real World Applications, 2014, 15, 361-366.	1.7	3
125	Consistent MPFA Discretization for Flow in the Presence of Gravity. Water Resources Research, 2019, 55, 10105-10118.	4.2	3
126	Stable mixed finite elements for linear elasticity with thin inclusions. Computational Geosciences, 2021, 25, 603-620.	2.4	3

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127	A multipoint stress mixed finite element method for elasticity on quadrilateral grids. Numerical Methods for Partial Differential Equations, 2021, 37, 1886-1915.	3.6	3
128	A Mixed Approach to the Poisson Problem with Line Sources. SIAM Journal on Numerical Analysis, 2021, 59, 1117-1139.	2.3	3
129	Well-Posedness and Discretization for a Class of Models for Mixed-Dimensional Problems with High-Dimensional Gap. SIAM Journal on Applied Mathematics, 2021, 81, 2218-2245.	1.8	3
130	Free Energy Diminishing Discretization of Darcy-Forchheimer Flow in Poroelastic Media. Springer Proceedings in Mathematics and Statistics, 2020, , 203-211.	0.2	3
131	A Cahn-Hilliard-Biot system and its generalized gradient flow structure. Applied Mathematics Letters, 2021, 126, 107799.	2.7	3
132	Temperature-Dependent Bending Rigidity of AB -Stacked Bilayer Graphene. Physical Review Letters, 2021, 127, 266102.	7.8	3
133	Incorporating Geological Uncertainty in Error Control for Linear Solvers. , 2015, , .		2
134	Iterative Linearisation Schemes for Doubly Degenerate Parabolic Equations. Lecture Notes in Computational Science and Engineering, 2019, , 49-63.	0.3	2
135	Modeling and discretization of flow in porous media with thin, full€tensor permeability inclusions. International Journal for Numerical Methods in Engineering, 2021, 122, 4730-4750.	2.8	2
136	Variational and Heterogeneous Multiscale Methods. , 2010, , 713-720.		2
137	Stability analysis of probabilistic soil moisture dynamics. Advances in Water Resources, 2008, 31, 418-423.	3.8	1
138	Multiscale Methods for Multiphase Flow in Porous Media. Lecture Notes in Computational Science and Engineering, 2009, , 39-50.	0.3	1
139	Simulating Two-phase Flow in Porous Media with Anisotropic Relative Permeabilities. , 2011, , .		1
140	On the Properties of the Parameter Space of the Generalized Continuum Transport Model for Description of Fluid Flow in Porous Networks. Transport in Porous Media, 2017, 119, 673-688.	2.6	1
141	Efficient water table evolution discretization using domain transformation. Computational Geosciences, 2017, 21, 3-11.	2.4	1
142	A heterogeneous multiscale MPFA method for single-phase flows in porous media with inertial effects. Computational Geosciences, 2019, 23, 107-126.	2.4	1
143	A minimalist model for coevolving supply and drainage networks. Royal Society Open Science, 2021, 8, 201407.	2.4	1
144	Robust Linear Domain Decomposition Schemes for Reduced Nonlinear Fracture Flow Models. SIAM Journal on Numerical Analysis, 2021, 59, 583-612.	2.3	1

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145	Vertically averaged approaches for CO2 migration with solubility trapping. , 2011, .		1
146	Fractal structures in freezing brine. Journal of Fluid Mechanics, 2017, 826, 975-995.	3.4	0
147	Mathematics and Medicine: How Mathematics, Modelling and Simulations Can Lead to Better Diagnosis and Treatments. Lecture Notes in Computational Science and Engineering, 2019, , 65-80.	0.3	0
148	Influence of capillary pressure and trapping hysteresis on large-scale CO_2 migration. Journal of Coupled Systems and Multiscale Dynamics, 2013, 1, 442-458.	0.2	0
149	A Multi-Scale Flow Model for Studying Blood Circulation in Vascular System. Lecture Notes in Computational Science and Engineering, 2021, , 743-751.	0.3	0
150	Convergence of a TPFA Finite Volume Scheme for Mixed-Dimensional Flow Problems. Springer Proceedings in Mathematics and Statistics, 2020, , 435-444.	0.2	0
151	Modeling the Process of Speciation Using a Multiscale Framework Including A Posteriori Error Estimates. SIAM Journal on Applied Mathematics, 2022, 82, 450-475.	1.8	0