Franck J Vernerey

List of Publications by Year
in descending order

90 papers	2,811 citations	185998 28 h-index	189595 50 g-index
91 all docs	91 docs citations	91 times ranked	2069 citing authors

#	Article	IF	Citations
1	Structure and Mechanical Performance of a â€œModernâ€•Fish Scale. Advanced Engineering Materials, 2012, 14, B185.	1.6	166
2	Multi-scale micromorphic theory for hierarchical materials. Journal of the Mechanics and Physics of Solids, 2007, 55, 2603-2651.	2.3	161
3	On the mechanics of fishscale structures. International Journal of Solids and Structures, 2010, 47, 2268-2275.	1.3	119
4	Multi-scale constitutive model and computational framework for the design of ultra-high strength, high toughness steels. Computer Methods in Applied Mechanics and Engineering, 2004, 193, 1865-1908.	3.4	112
5	A statistically-based continuum theory for polymers with transient networks. Journal of the Mechanics and Physics of Solids, 2017, 107, 1-20.	2.3	110
6	Puncture resistance of the scaled skin from striped bass: Collective mechanisms and inspiration for new flexible armor designs. Journal of the Mechanical Behavior of Biomedical Materials, 2013, 24, 30-40.	1.5	105
7	A micromorphic model for the multiple scale failure of heterogeneous materials. Journal of the Mechanics and Physics of Solids, 2008, 56, 1320-1347.	2.3	94
8	Skin and scales of teleost fish: Simple structure but high performance and multiple functions. Journal of the Mechanics and Physics of Solids, 2014, 68, 66-76.	2.3	87
9	Multiresolution analysis for material design. Computer Methods in Applied Mechanics and Engineering, 2006, 195, 5053-5076.	3.4	85
10	A constrained mixture approach to mechano-sensing and force generation in contractile cells. Journal of the Mechanical Behavior of Biomedical Materials, 2011, 4, 1683-1699.	1.5	78
11	Development of Processing Methods to Improve Strength of Concrete with 100% Recycled Coarse Aggregate. Journal of Materials in Civil Engineering, 2015, 27, .	1.3	78
12	Statistical Damage Mechanics of Polymer Networks. Macromolecules, 2018, 51, 6609-6622.	2.2	74
13	Tuning tissue growth with scaffold degradation in enzyme-sensitive hydrogels: a mathematical model. Soft Matter, 2016, 12, 7505-7520.	1.2	63
14	Programmable Hydrogels for Cell Encapsulation and Neoâ€Tissue Growth to Enable Personalized Tissue Engineering. Advanced Healthcare Materials, 2018, 7, 1700605.	3.9	63
15	Mechanics of 3D Cellâ€“Hydrogel Interactions: Experiments, Models, and Mechanisms. Chemical Reviews, 2021, 121, 11085-11148.	23.0	62
16	An extended finite element/level set method to study surface effects on the mechanical behavior and properties of nanomaterials. International Journal for Numerical Methods in Engineering, 2010, 84, 1466-1489.	1.5	59
17	Transient response of nonlinear polymer networks: A kinetic theory. Journal of the Mechanics and Physics of Solids, 2018, 115, 230-247.	2.3	58
18	Bioinspired Fabrication and Characterization of a Synthetic Fish Skin for the Protection of Soft Materials. ACS Applied Materials & Interfaces, 2015, 7, 5972-5983.	4.0	56

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19	On the role of hydrogel structure and degradation in controlling the transport of cell-secreted matrix molecules for engineered cartilage. Journal of the Mechanical Behavior of Biomedical Materials, 2013, 19, 61-74.	1.5	50
20	Mechanics of fish skin: A computational approach for bio-inspired flexible composites. International Journal of Solids and Structures, 2014, 51, 274-283.	1.3	49
21	Heterogeneity is key to hydrogel-based cartilage tissue regeneration. Soft Matter, 2017, 13, 4841-4855.	1.2	47
22	A mathematical model of the coupled mechanisms of cell adhesion, contraction and spreading. Journal of Mathematical Biology, 2014, 68, 989-1022.	0.8	43
23	Smart Polymers for Advanced Applications: A Mechanical Perspective Review. Frontiers in Materials, 2020, 7, .	1.2	40
24	Tuning Reaction and Diffusion Mediated Degradation of Enzymeâ€Sensitive Hydrogels. Advanced Healthcare Materials, 2016, 5, 432-438.	3.9	38
25	Remotely Triggered Locomotion of Hydrogel Mag-bots in Confined Spaces. Scientific Reports, 2017, 7, 16178.	1.6	38
26	Mathematical model of the role of degradation on matrix development in hydrogel scaffold. Biomechanics and Modeling in Mechanobiology, 2014, 13, 167-183.	1.4	36
27	Determination of the polymer-solvent interaction parameter for PEG hydrogels in water: Application of a self learning algorithm. Polymer, 2015, 66, 135-147.	1.8	30
28	How do fire ants control the rheology of their aggregations? A statistical mechanics approach. Journal of the Royal Society Interface, 2018, 15, 20180642.	1.5	29
29	Armours for soft bodies: how far can bioinspiration take us?. Bioinspiration and Biomimetics, 2018, 13, 041004.	1.5	27
30	Rate-dependent fracture of transient networks. Journal of the Mechanics and Physics of Solids, 2020, 143, 104028.	2.3	27
31	Triphasic mixture model of cell-mediated enzymatic degradation of hydrogels. Computer Methods in Biomechanics and Biomedical Engineering, 2012, 15, 1197-1210.	0.9	26
32	Role of catch bonds in actomyosin mechanics and cell mechanosensitivity. Physical Review E, 2016, 94, 012403.	0.8	26
33	Recellularization and Integration of Dense Extracellular Matrix by Percolation of Tissue Microparticles. Advanced Functional Materials, 2021, 31, 2103355.	7.8	26
34	An Eulerian/XFEM formulation for the large deformation of cortical cell membrane. Computer Methods in Biomechanics and Biomedical Engineering, 2011, 14, 433-445.	0.9	25
35	An XFEMâ€based numerical strategy to model mechanical interactions between biological cells and a deformable substrate. International Journal for Numerical Methods in Engineering, 2012, 92, 238-267.	1.5	24
36	Mechanics and stability of vesicles and droplets in confined spaces. Physical Review E, 2016, 94, 062613.	0.8	24

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37	Multi-length scale micromorphic process zone model. Computational Mechanics, 2009, 44, 433-445.	2.2	23
38	A thermodynamical model for stress-fiber organization in contractile cells. Applied Physics Letters, 2012, 100, 13702-137024.	1.5	23
39	Separating the contributions of zona pellucida and cytoplasm in the viscoelastic response of human oocytes. Acta Biomaterialia, 2019, 85, 253-262.	4.1	23
40	A mixture approach to investigate interstitial growth in engineering scaffolds. Biomechanics and Modeling in Mechanobiology, 2016, 15, 259-278.	1.4	21
41	The porous media's effect on the permeation of elastic (soft) particles. Journal of Membrane Science, 2017, 535, 10-19.	4.1	21
42	Adaptive concurrent multiscale model for fracture and crack propagation in heterogeneous media. Computer Methods in Applied Mechanics and Engineering, 2014, 276, 566-588.	3.4	20
43	The Chain Distribution Tensor: Linking Nonlinear Rheology and Chain Anisotropy in Transient Polymers. Polymers, 2018, 10, 848.	2.0	20
44	The mechanics of hydrogel crawlers in confined environment. Journal of the Royal Society Interface, 2017, 14, 20170242.	1.5	20
45	Rate-Dependent Damage Mechanics of Polymer Networks with Reversible Bonds. Macromolecules, 2021, 54, 10801-10813.	2.2	20
46	<sup />Understanding the Spatiotemporal Degradation Behavior of Aggrecanase-Sensitive Poly(ethylene glycol) Hydrogels for Use in Cartilage Tissue Engineering. Tissue Engineering - Part A, 2017, 23, 795-810.	1.6	19
47	A Statistical Model of Expansive Growth in Plant and Fungal Cells: The Case of Phycomyces. Biophysical Journal, 2018, 115, 2428-2442.	0.2	19
48	A coupled Eulerianâ€“Lagrangian extended finite element formulation for simulating large deformations in hyperelastic media with moving free boundaries. Computer Methods in Applied Mechanics and Engineering, 2015, 283, 280-302.	3.4	18
49	The Effective Permeability of Cracks and Interfaces in Porous Media. Transport in Porous Media, 2012, 93, 815-829.	1.2	17
50	Local Heterogeneities Improve Matrix Connectivity in Degradable and Photoclickable Poly(ethylene) Tj ETQq0 0 0 rgBT /Overlock 10 Tf 5 2017, 3, 2480-2492.	2.6	17
51	A simple statistical approach to model the time-dependent response of polymers with reversible cross-links. Composites Part B: Engineering, 2017, 115, 257-265.	5.9	17
52	A theoretical treatment on the mechanics of interfaces in deformable porous media. International Journal of Solids and Structures, 2011, 48, 3129-3141.	1.3	15
53	â€˜The role of percolation in hydrogel-based tissue engineering and bioprintingâ€™. Current Opinion in Biomedical Engineering, 2020, 15, 68-74.	1.8	15
54	Nonsteady fracture of transient networks: The case of vitrimer. Proceedings of the National Academy of Sciences of the United States of America, 2021, 118, .	3.3	14

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55	Computational modeling of the large deformation and flow of viscoelastic polymers. Computational Mechanics, 2019, 63, 725-745.	2.2	13
56	Transient mechanics of slide-ring networks: A continuum model. Journal of the Mechanics and Physics of Solids, 2021, 146, 104212.	2.3	12
57	Treadmilling and dynamic protrusions in fire ant rafts. Journal of the Royal Society Interface, 2021, 18, 20210213.	1.5	12
58	Mechanics of responsive polymers via conformationally switchable molecules. Journal of the Mechanics and Physics of Solids, 2018, 113, 65-81.	2.3	10
59	Force-dependent bond dissociation explains the rate-dependent fracture of vitrimers. Soft Matter, 2021, 17, 6669-6674.	1.2	10
60	Mechanics of transient semi-flexible networks: Soft-elasticity, stress relaxation and remodeling. Journal of the Mechanics and Physics of Solids, 2022, 160, 104776.	2.3	10
61	An Xâ€FEMâ€based numericalâ€"asymptotic expansion for simulating a Stokes flow near a sharp corner. International Journal for Numerical Methods in Engineering, 2015, 102, 79-98.	1.5	9
62	Rate-dependent failure mechanism of elastomers. International Journal of Mechanical Sciences, 2017, 130, 448-457.	3.6	9
63	Interplay of elastic instabilities and viscoelasticity in the finite deformation of thin membranes. Physical Review E, 2019, 99, 042502.	0.8	9
64	A Transient Microsphere Model for Nonlinear Viscoelasticity in Dynamic Polymer Networks. Journal of Applied Mechanics, Transactions ASME, 2022, 89, .	1.1	9
65	A particleâ€based moving interface method (PMIM) for modeling the large deformation of boundaries in soft matter systems. International Journal for Numerical Methods in Engineering, 2016, 107, 923-946.	1.5	8
66	Structural Modeling of Mechanosensitivity in Non-Muscle Cells: Multiscale Approach to Understand Cell Sensing. ACS Biomaterials Science and Engineering, 2017, 3, 2934-2942.	2.6	8
67	Phoretic motion of soft vesicles and droplets: an XFEM/particle-based numerical solution. Computational Mechanics, 2017, 60, 143-161.	2.2	8
68	A network model of transient polymers: exploring the micromechanics of nonlinear viscoelasticity. Soft Matter, 2021, 17, 8742-8757.	1.2	8
69	Enhanced Diffusion by Reversible Binding to Active Polymers. Macromolecules, 2021, 54, 1850-1858.	2.2	8
70	Bridging the Scales to Explore Cellular Adaptation and Remodeling. BioNanoScience, 2011, 1, 110-115.	1.5	7
71	On the blistering of thermo-sensitive hydrogel: the volume phase transition and mechanical instability. Soft Matter, 2019, 15, 5842-5853.	1.2	7
72	Mechanics of transiently cross-linked nematic networks. Journal of the Mechanics and Physics of Solids, 2020, 141, 104021.	2.3	7

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73	Localized Enzymatic Degradation of Polymers: Physics and Scaling Laws. Physical Review Applied, 2018, 9, .	1.5	6
74	Spatiotemporal neocartilage growth in matrix-metalloproteinase-sensitive poly(ethylene glycol) hydrogels under dynamic compressive loading: an experimental and computational approach. Journal of Materials Chemistry B, 2020, 8, 2775-2791.	2.9	6
75	Physically motivated models of polymer networks with dynamic cross-links: comparative study and future outlook. Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 2021, 477, .	1.0	6
76	A mesoscale model for the micromechanical study of gels. Journal of the Mechanics and Physics of Solids, 2022, 167, 104982.	2.3	6
77	Dynamics of Stress Fibers Turnover in Contractile Cells. Journal of Engineering Mechanics - ASCE, 2012, 138, 1282-1287.	1.6	5
78	A physics-based micromechanical model for electroactive viscoelastic polymers. Journal of Intelligent Material Systems and Structures, 2018, 29, 2902-2918.	1.4	5
79	Helical growth during the phototropic response, avoidance response, and in stiff mutants of Phycomyces blakesleeanus. Scientific Reports, 2021, 11, 3653.	1.6	5
80	Analysis of Soft Fibers with Kinematic Constraints and Cross-Links by Finite Deformation Beam Theory. Journal of Engineering Mechanics - ASCE, 2011, 137, 527-536.	1.6	4
81	Mechanical instability and percolation of deformable particles through porous networks. Physical Review E, 2018, 97, 042607.	0.8	4
82	Computational exploration of treadmilling and protrusion growth observed in fire ant rafts. PLoS Computational Biology, 2022, 18, e1009869.	1.5	4
83	Nonlinear, Large Deformation Finite-Element Beam/Column Formulation for the Study of the Human Spine: Investigation of the Role of Muscle on Spine Stability. Journal of Engineering Mechanics - ASCE, 2010, 136, 1319-1328.	1.6	3
84	The role of surface properties on the penetration resistance of scaled skins. Mechanics Research Communications, 2019, 98, 1-8.	1.0	3
85	Moving while youâ€™re stuck: a macroscopic demonstration of an active system inspired by binding-mediated transport in biology. Soft Matter, 2021, 17, 2957-2962.	1.2	3
86	A Microstructure-Based Continuum Model for Multiphase Solids. Mechanics of Advanced Materials and Structures, 2014, 21, 441-456.	1.5	2
87	Dynamic competition of inflation and delamination in the finite deformation of thin membranes. Soft Matter, 2019, 15, 6630-6641.	1.2	2
88	Front Cover Advanced Materials 4/2012. Advanced Engineering Materials, 2012, 14, n/a-n/a.	1.6	1
89	Computational modeling of the large deformation and flow of viscoelastic polymers. Computational Mechanics, 2019, 63, 725-745.	2.2	1
90	Structure and Mechanical Performance of Teleost Fish Scales. Materials Research Society Symposia Proceedings, 2012, 1420, 30.	0.1	0