Markus J Buehler

List of Publications by Year in Descending Order

501 papers	28,455 citations	88 h-index	150 g-index
564 ext. papers	32,889 ext. citations	8.1 avg, IF	7.94 L-index

#	Paper	IF	Citations
501	ColGen: An end-to-end deep learning model to predict thermal stability of de novo collagen sequences. *Journal of the Mechanical Behavior of Biomedical Materials*, **2022**, 125, 104921	4.1	1
500	Biomimicry for natural and synthetic composites and use of machine learning in hierarchical design **2022**, 141-182		
499	Deep learning based design of porous graphene for enhanced mechanical resilience. *Computational Materials Science*, **2022**, 206, 111270	3.2	0
498	Fundamental Investigation of Biomass Interaction for Green Composites: Experiments and Molecular Dynamics Simulations. *Advanced Functional Materials*, **2022**, 32, 2109881	15.6	1
497	DeepBuckle: Extracting physical behavior directly from empirical observation for a material agnostic approach to analyze and predict buckling. *Journal of the Mechanics and Physics of Solids*, **2022**, 104909	5	0
496	Generative design, manufacturing, and molecular modeling of 3D architected materials based on natural language input. *APL Materials*, **2022**, 10, 041107	5.7	2
495	End-to-end Prediction of Multimaterial Stress Fields and Fracture Patterns using Cycle-Consistent Adversarial and Transformer Neural Networks. *Biomedical Engineering Advances*, **2022**, 100038		2
494	Encoding and exploring latent design space of optimal material structures via a VAE-LSTM model. *Forces in Mechanics*, **2021**, 5, 100054	1.5	2
493	Sonification of a 3-D Spider Web and Reconstitution for Musical Composition Using Granular Synthesis. *Computer Music Journal*, **2021**, 44, 43-59	0.5	2
492	Words to Matter: De novo Architected Materials Design Using Transformer Neural Networks. *Frontiers in Materials*, **2021**, 8,	4	4
491	Bioinspired translation of classical music intoprotein structures using deep learning and molecular modeling. *Bioinspiration and Biomimetics*, **2021**, 17,	2.6	1
490	Screening and Understanding Li Adsorption on Two-Dimensional Metallic Materials by Learning Physics and Physics-Simplified Learning. *Jacs Au*, **2021**, 1, 1904-1914		3
489	Understanding Plant Biomass via Computational Modeling. *Advanced Materials*, **2021**, 33, e2003206	24	10
488	Deep learning model to predict complex stress and strain fields in hierarchical composites. *Science Advances*, **2021**, 7,	14.3	31
487	Deep learning model to predict fracture mechanisms of graphene. *Npj 2D Materials and Applications* , **2021**, 5,	8.8	9
486	Surface adhesion of viruses and bacteria: Defend only and/or extinguish also?! A perspective. *MRS Advances*, **2021**, 6, 1-7	0.7	1
485	A coarse-grained mechanical model for folding and unfolding of tropoelastin with possible mutations. *Acta Biomaterialia*, **2021**, 134, 477-489	10.8	2

484	Effect of the silica nanoparticle size on the osteoinduction of biomineralized silk-silica nanocomposites. *Acta Biomaterialia*, **2021**, 120, 203-212	10.8	3
483	Comparative Analysis of Nanomechanical Features of Coronavirus Spike Proteins and Correlation with Lethality and Infection Rate. *Matter*, **2021**, 4, 265-275	12.7	6
482	Tuning Mechanical Properties in Polycrystalline Solids Using a Deep Generative Framework. *Advanced Engineering Materials*, **2021**, 23, 2001339	3.5	4
481	WebNet: A biomateriomic three-dimensional spider web neural net. *Extreme Mechanics Letters*, **2021**, 42, 101034	3.9	3
480	A perspective on musical representations of folded protein nanostructures. *Nano Futures*, **2021**, 5, 012501	3.6	3
479	Molecular origin of viscoelasticity in mineralized collagen fibrils. *Biomaterials Science*, **2021**, 9, 3390-3400	7.4	7
478	Transition-metal coordinate bonds for bioinspired macromolecules with tunable mechanical properties. *Nature Reviews Materials*, **2021**, 6, 421-436	73.3	37
477	Designing and fabricating materials from fire using sonification and deep learning. *IScience*, **2021**, 24, 102873	6.1	8
476	Fuzzy binding model of molecular interactions between tropoelastin and integrin alphaVbeta3. *Biophysical Journal*, **2021**, 120, 3138-3151	2.9	2
475	End-to-end deep learning method to predict complete strain and stress tensors for complex hierarchical composite microstructures. *Journal of the Mechanics and Physics of Solids*, **2021**, 154, 104506	5	14
474	Frank-van der Merwe growth in bilayer graphene. *Matter*, **2021**,	12.7	7
473	Deep learning approach to assess damage mechanics of bone tissue. *Journal of the Mechanical Behavior of Biomedical Materials*, **2021**, 123, 104761	4.1	6
472	Multiscale Modeling and Applications of Bioinspired Materials with Gyroid Structures. *Springer Series in Materials Science*, **2021**, 629-644	0.9	0
471	Artificial intelligence and machine learning in design of mechanical materials. *Materials Horizons*, **2021**, 8, 1153-1172	14.4	54
470	A deep learning augmented genetic algorithm approach to polycrystalline 2D material fracture discovery and design. *Applied Physics Reviews*, **2021**, 8, 041414	17.3	2
469	Reaching the horizon: First MRS Bulletin Impact articles published. *MRS Bulletin*, **2020**, 45, 879-879	3.2	
468	Machine learning model for fast prediction of the natural frequencies of protein molecules.. *RSC Advances*, **2020**, 10, 16607-16615	3.7	2
467	Synergistic Roll-to-Roll Transfer and Doping of CVD-Graphene Using Parylene for Ambient-Stable and Ultra-Lightweight Photovoltaics. *Advanced Functional Materials*, **2020**, 30, 2001924	15.6	32

466	Sonification based protein design using artificial intelligence, structure prediction, and analysis using molecular modeling. *APL Bioengineering*, **2020**, 4, 016108	6.6	16
465	Mechanics of Mineralized Collagen Fibrils upon Transient Loads. *ACS Nano*, **2020**, 14, 8307-8316	16.7	10
464	Perspectives on three-dimensional printing of self-assembling materials and structures. *Current Opinion in Biomedical Engineering*, **2020**, 15, 59-67	4.4	10
463	Artificial intelligence method to design and fold alpha-helical structural proteins from the primary amino acid sequence. *Extreme Mechanics Letters*, **2020**, 36, 100652	3.9	16
462	The Order-Disorder Continuum: Linking Predictions of Protein Structure and Disorder through Molecular Simulation. *Scientific Reports*, **2020**, 10, 2068	4.9	7
461	Adverse effects of Alport syndrome-related Gly missense mutations on collagen type IV: Insights from molecular simulations and experiments. *Biomaterials*, **2020**, 240, 119857	15.6	11
460	Wave Propagation and Energy Dissipation in Collagen Molecules. *ACS Biomaterials Science and Engineering*, **2020**, 6, 1367-1374	5.5	16
459	Exploration of Biomass-Derived Activated Carbons for Use in Vanadium Redox Flow Batteries. *ACS Sustainable Chemistry and Engineering*, **2020**, 8, 9472-9482	8.3	9
458	Multiscale structural insights of load bearing bamboo: A computational modeling approach. *Journal of the Mechanical Behavior of Biomedical Materials*, **2020**, 107, 103743	4.1	12
457	Silk-Based Hierarchical Materials for High Mechanical Performance at the Interface of Modeling, Synthesis, and Characterization **2020**, 1547-1574		
456	Multiscale Modeling of Structural Materials: Chemistry and Mechanical Performance **2020**, 1541-1546		
455	Multiscale Modeling of Lignocellulosic Biomass **2020**, 1627-1648		0
454	Liquified protein vibrations, classification and cross-paradigm de novo image generation using deep neural networks. *Nano Futures*, **2020**, 4, 035004	3.6	8
453	Electrospinning Piezoelectric Fibers for Biocompatible Devices. *Advanced Healthcare Materials*, **2020**, 9, e1901287	10.1	46
452	Melanin Biopolymers: Tailoring Chemical Complexity for Materials Design. *Angewandte Chemie*, **2020**, 132, 11292-11301	3.6	12
451	Melanin Biopolymers: Tailoring Chemical Complexity for Materials Design. *Angewandte Chemie - International Edition*, **2020**, 59, 11196-11205	16.4	64
450	De novo topology optimization of total ossicular replacement prostheses. *Journal of the Mechanical Behavior of Biomedical Materials*, **2020**, 103, 103541	4.1	10
449	Observations of 3 nm Silk Nanofibrils Exfoliated from Natural Silkworm Silk Fibers **2020**, 2, 153-160		14

448	A semi-supervised approach to architected materials design using graph neural networks. *Extreme Mechanics Letters*, **2020**, 41, 101029	3.9	9
447	Using Deep Learning to Predict Fracture Patterns in Crystalline Solids. *Matter*, **2020**, 3, 197-211	12.7	39
446	Nonlinear mechanics of lamin filaments and the meshwork topology build an emergent nuclear lamina. *Nature Communications*, **2020**, 11, 6205	17.4	17
445	Mesomechanics of a three-dimensional spider web. *Journal of the Mechanics and Physics of Solids*, **2020**, 144, 104096	5	3
444	Accumulation of collagen molecular unfolding is the mechanism of cyclic fatigue damage and failure in collagenous tissues. *Science Advances*, **2020**, 6, eaba2795	14.3	20
443	Chirality-Dependent Second Harmonic Generation of MoS Nanoscroll with Enhanced Efficiency. *ACS Nano*, **2020**, 14, 13333-13342	16.7	11
442	Probing the Role of Bone Lamellar Patterns through Collagen Microarchitecture Mapping, Numerical Modeling, and 3D-Printing. *Advanced Engineering Materials*, **2020**, 22, 2000387	3.5	5
441	Atomically Sharp Dual Grain Boundaries in 2D WS Bilayers. *Small*, **2019**, 15, e1902590	11	8
440	The hidden structure of human enamel. *Nature Communications*, **2019**, 10, 4383	17.4	51
439	Remarkably Distinct Mechanical Flexibility in Three Structurally Similar Semiconducting Organic Crystals Studied by Nanoindentation and Molecular Dynamics. *Chemistry of Materials*, **2019**, 31, 1391-1402	9.6	50
438	Allysine modifications perturb tropoelastin structure and mobility on a local and global scale. *Matrix Biology Plus*, **2019**, 2, 100002	5.1	11
437	Molecular dynamics study of the mechanical properties of polydisperse pressure-sensitive adhesives. *International Journal of Adhesion and Adhesives*, **2019**, 92, 58-64	3.4	4
436	A Self-Consistent Sonification Method to Translate Amino Acid Sequences into Musical Compositions and Application in Protein Design Using Artificial Intelligence. *ACS Nano*, **2019**, 13, 7471-7482	16.7	53
435	Anisotropic Fracture Dynamics Due to Local Lattice Distortions. *ACS Nano*, **2019**, 13, 5693-5702	16.7	11
434	Analysis of the vibrational and sound spectrum of over 100,000 protein structures and application in sonification. *Extreme Mechanics Letters*, **2019**, 29,	3.9	11
433	Grain Boundaries as Electrical Conduction Channels in Polycrystalline Monolayer WS. *ACS Applied Materials & Interfaces*, **2019**, 11, 10189-10197	9.5	12
432	Spider dragline silk as torsional actuator driven by humidity. *Science Advances*, **2019**, 5, eaau9183	14.3	68
431	Dynamic pigmentary and structural coloration within cephalopod chromatophore organs. *Nature Communications*, **2019**, 10, 1004	17.4	54

430	Paraffin-enabled graphene transfer. *Nature Communications*, **2019**, 10, 867	17.4	122
429	Multiscale Design of Graphyne-Based Materials for High-Performance Separation Membranes. *Advanced Materials*, **2019**, 31, e1805665	24	21
428	Nature's Way: Hierarchical Strengthening through Weakness. *Matter*, **2019**, 1, 302-303	12.7	6
427	Coarse-grained model of tropoelastin self-assembly into nascent fibrils. *Materials Today Bio*, **2019**, 3, 100016	9.9	12
426	Additive Manufacturing Approaches for Hydroxyapatite-Reinforced Composites. *Advanced Functional Materials*, **2019**, 29, 1903055	15.6	70
425	Conductive Silk-Based Composites Using Biobased Carbon Materials. *Advanced Materials*, **2019**, 31, e1904720	24	26
424	Design and Fabrication of Silk Templated Electronic Yarns and Applications in Multifunctional Textiles. *Matter*, **2019**, 1, 1411-1425	12.7	50
423	Artificial intelligence design algorithm for nanocomposites optimized for shear crack resistance. *Nano Futures*, **2019**, 3, 035001	3.6	28
422	Reversible MoS Origami with Spatially Resolved and Reconfigurable Photosensitivity. *Nano Letters*, **2019**, 19, 7941-7949	11.5	33
421	Sounds interesting: can sonification help us design new proteins?. *Expert Review of Proteomics*, **2019**, 16, 875-879	4.2	11
420	Biological Material Interfaces as Inspiration for Mechanical and Optical Material Designs. *Chemical Reviews*, **2019**, 119, 12279-12336	68.1	73
419	Self-Folding Hybrid Graphene Skin for 3D Biosensing. *Nano Letters*, **2019**, 19, 1409-1417	11.5	36
418	Mechanical behavior of nanocomposites. *MRS Bulletin*, **2019**, 44, 19-24	3.2	31
417	Tropoelastin is a Flexible Molecule that Retains its Canonical Shape. *Macromolecular Bioscience*, **2019**, 19, e1800250	5.5	16
416	Multiscale Modeling of Silk and Silk-Based Biomaterials-A Review. *Macromolecular Bioscience*, **2019**, 19, e1800253	5.5	23
415	Multiscale modeling of keratin, collagen, elastin and related human diseases: Perspectives from atomistic to coarse-grained molecular dynamics simulations. *Extreme Mechanics Letters*, **2018**, 20, 112-124	3.9	19
414	Materials-by-Design: Computation, Synthesis, and Characterization from Atoms to Structures. *Physica Scripta*, **2018**, 93,	2.6	23
413	Nanofibrils in nature and materials engineering. *Nature Reviews Materials*, **2018**, 3,	73.3	304

412	The different distribution of enzymatic collagen cross-links found in adult and children bone result in different mechanical behavior of collagen. *Bone*, **2018**, 110, 107-114	4.7	16
411	Integration of stiff graphene and tough silk for the design and fabrication of versatile electronic materials. *Advanced Functional Materials*, **2018**, 28, 1705291	15.6	109
410	High-Strength, Durable All-Silk Fibroin Hydrogels with Versatile Processability toward Multifunctional Applications. *Advanced Functional Materials*, **2018**, 28, 1704757	15.6	89
409	Interlocking Friction Governs the Mechanical Fracture of Bilayer MoS. *ACS Nano*, **2018**, 12, 3600-3608	16.7	30
408	Mechanical exfoliation of two-dimensional materials. *Journal of the Mechanics and Physics of Solids*, **2018**, 115, 248-262	5	78
407	Predicting rates of in vivo degradation of recombinant spider silk proteins. *Journal of Tissue Engineering and Regenerative Medicine*, **2018**, 12, e97-e105	4.4	14
406	De novo composite design based on machine learning algorithm. *Extreme Mechanics Letters*, **2018**, 18, 19-28	3.9	160
405	Tensan Silk-Inspired Hierarchical Fibers for Smart Textile Applications. *ACS Nano*, **2018**, 12, 6968-6977	16.7	69
404	Bioinspired hierarchical composite design using machine learning: simulation, additive manufacturing, and experiment. *Materials Horizons*, **2018**, 5, 939-945	14.4	186
403	Tunable mechanical properties through texture control of polycrystalline additively manufactured materials using adjoint-based gradient optimization. *Acta Mechanica*, **2018**, 229, 4033-4044	2.1	9
402	Hierarchical nanostructures for functional materials. *Nanotechnology*, **2018**, 29, 280201	3.4	4
401	Unraveling the Molecular Mechanisms of Thermo-responsive Properties of Silk-Elastin-Like Proteins by Integrating Multiscale Modeling and Experiment. *Journal of Materials Chemistry B*, **2018**, 6, 3727-3734	7.3	14
400	The Rise of Hierarchical Nanostructured Materials from Renewable Sources: Learning from Nature. *ACS Nano*, **2018**, 12, 7425-7433	16.7	91
399	Improving the performance of pressure sensitive adhesives by tuning the crosslinking density and locations. *Polymer*, **2018**, 154, 164-171	3.9	16
398	Sub-nanometre channels embedded in two-dimensional materials. *Nature Materials*, **2018**, 17, 129-133	27	75
397	Silk-Based Hierarchical Materials for High Mechanical Performance at the Interface of Modeling, Synthesis, and Characterization **2018**, 1-28		1
396	Polydopamine and eumelanin models in various oxidation states. *Physical Chemistry Chemical Physics*, **2018**, 20, 28135-28143	3.6	19
395	Fabrication and Characterization of Recombinant Silk-Elastin-Like-Protein (SELP) Fiber. *Macromolecular Bioscience*, **2018**, 18, e1800265	5.5	18

394	Multiscale Modeling of Lignocellulosic Biomass **2018**, 1-22		1
393	Multiscale Modeling of Structural Materials: Chemistry and Mechanical Performance **2018**, 1-6		
392	Imaging and analysis of a three-dimensional spider web architecture. *Journal of the Royal Society Interface*, **2018**, 15,	4.1	22
391	Molecular characterization and atomistic model of biocrude oils from hydrothermal liquefaction of microalgae. *Algal Research*, **2018**, 35, 262-273	5	8
390	Combining In Silico Design and Biomimetic Assembly: A New Approach for Developing High-Performance Dynamic Responsive Bio-Nanomaterials. *Advanced Materials*, **2018**, 30, e1802306	24	23
389	Molecular model of human tropoelastin and implications of associated mutations. *Proceedings of the National Academy of Sciences of the United States of America*, **2018**, 115, 7338-7343	11.5	26
388	Multiscale Mechanics of Triply Periodic Minimal Surfaces of Three-Dimensional Graphene Foams. *Nano Letters*, **2018**, 18, 4845-4853	11.5	39
387	Biopolymer nanofibrils: structure, modeling, preparation, and applications. *Progress in Polymer Science*, **2018**, 85, 1-56	29.6	183
386	Intracellular Pathways Involved in Bone Regeneration Triggered by Recombinant Silk-silica Chimeras. *Advanced Functional Materials*, **2018**, 28, 1702570	15.6	26
385	The mechanics and design of a lightweight three-dimensional graphene assembly. *Science Advances* , **2017**, 3, e1601536	14.3	250
384	Computational smart polymer design based on elastin protein mutability. *Biomaterials*, **2017**, 127, 49-60	15.6	39
383	Advanced Structural Materials by Bioinspiration . *Advanced Engineering Materials*, **2017**, 19, 1600787	3.5	70
382	Protein-free formation of bone-like apatite: New insights into the key role of carbonation. *Biomaterials*, **2017**, 127, 75-88	15.6	48
381	Ion Effect and Metal-Coordinated Cross-Linking for Multiscale Design of Nereis Jaw Inspired Mechanomutable Materials. *ACS Nano*, **2017**, 11, 1858-1868	16.7	13
380	Synergistic Integration of Experimental and Simulation Approaches for the de Novo Design of Silk-Based Materials. *Accounts of Chemical Research*, **2017**, 50, 866-876	24.3	34
379	Nacre-inspired design of graphene oxide□olydopamine nanocomposites for enhanced mechanical properties and multi-functionalities. *Nano Futures*, **2017**, 1, 011003	3.6	30
378	Multiscale Modeling of Muscular-Skeletal Systems. *Annual Review of Biomedical Engineering*, **2017**, 19, 435-457	12	23
377	Printing nature: Unraveling the role of nacre's mineral bridges. *Journal of the Mechanical Behavior of Biomedical Materials*, **2017**, 76, 135-144	4.1	84

376	Hierarchically Enhanced Impact Resistance of Bioinspired Composites. *Advanced Materials*, **2017**, 29, 1700060	24	159
375	Modeling and Experiment Reveal Structure and Nanomechanics across the Inverse Temperature Transition in Silk-Elastin-like Protein Polymers. *ACS Biomaterials Science and Engineering*, **2017**, 3, 2889-2899	5.5	16
374	Molecular level detection and localization of mechanical damage in collagen enabled by collagen hybridizing peptides. *Nature Communications*, **2017**, 8, 14913	17.4	111
373	Multiscale mechanics of the lateral pressure effect on enhancing the load transfer between polymer coated CNTs. *Nanoscale*, **2017**, 9, 5565-5576	7.7	5
372	Design and function of biomimetic multilayer water purification membranes. *Science Advances*, **2017**, 3, e1601939	14.3	161
371	Structural Insights into the Glycine Pair Motifs in Type III Collagen. *ACS Biomaterials Science and Engineering*, **2017**, 3, 269-278	5.5	0
370	Ultrathin thermoresponsive self-folding 3D graphene. *Science Advances*, **2017**, 3, e1701084	14.3	110
369	Unraveling the Molecular Requirements for Macroscopic Silk Supercontraction. *ACS Nano*, **2017**, 11, 9750-9758	13.7	31
368	Algorithm-driven design of fracture resistant composite materials realized through additive manufacturing. *Additive Manufacturing*, **2017**, 17, 47-54	6.1	33
367	Unusually low and density-insensitive thermal conductivity of three-dimensional gyroid graphene. *Nanoscale*, **2017**, 9, 13477-13484	7.7	33
366	Effect of Terminal Modification on the Molecular Assembly and Mechanical Properties of Protein-Based Block Copolymers. *Macromolecular Bioscience*, **2017**, 17, 1700095	5.5	9
365	Mutable polyelectrolyte tube arrays: mesoscale modeling and lateral force microscopy. *Soft Matter*, **2017**, 13, 5543-5557	3.6	3
364	Computational Framework to Predict Failure and Performance of Bone-Inspired Materials. *ACS Biomaterials Science and Engineering*, **2017**, 3, 3236-3243	5.5	11
363	Integrated Multiscale Biomaterials Experiment and Modeling. *ACS Biomaterials Science and Engineering*, **2017**, 3, 2628-2632	5.5	5
362	Polymorphic regenerated silk fibers assembled through bioinspired spinning. *Nature Communications*, **2017**, 8, 1387	17.4	158
361	Predicting Silk Fiber Mechanical Properties through Multiscale Simulation and Protein Design. *ACS Biomaterials Science and Engineering*, **2017**, 3, 1542-1556	5.5	22
360	Polydopamine and eumelanin molecular structures investigated with calculations. *Chemical Science*, **2017**, 8, 1631-1641	9.4	111
359	Integrated Modeling and Experimental Approaches to Control Silica Modification of Design Silk-Based Biomaterials. *ACS Biomaterials Science and Engineering*, **2017**, 3, 2877-2888	5.5	11

358	Quantitative Estimates of Bio-Remodeling on Coastal Rock Surfaces. *Journal of Marine Science and Engineering*, **2016**, 4, 37	2.4	10
357	Studies of chain substitution caused sub-fibril level differences in stiffness and ultrastructure of wildtype and oim/oim collagen fibers using multifrequency-AFM and molecular modeling. *Biomaterials*, **2016**, 107, 15-22	15.6	17
356	Aqueous Peptide-TiO2 Interfaces: Isoenergetic Binding via Either Entropically or Enthalpically Driven Mechanisms. *ACS Applied Materials & Interfaces*, **2016**, 8, 18620-30	9.5	35
355	Spider silk: Dynamic mechanics. *Nature Materials*, **2016**, 15, 1054-5	27	20
354	Liquid Exfoliated Natural Silk Nanofibrils: Applications in Optical and Electrical Devices. *Advanced Materials*, **2016**, 28, 7783-90	24	115
353	Intercalated water layers promote thermal dissipation at bio-nano interfaces. *Nature Communications*, **2016**, 7, 12854	17.4	45
352	Structure and mechanics of interfaces in biological materials. *Nature Reviews Materials*, **2016**, 1,	73.3	319
351	Subtle balance of tropoelastin molecular shape and flexibility regulates dynamics and hierarchical assembly. *Science Advances*, **2016**, 2, e1501145	14.3	34
350	Molecular Modeling and Mechanics of Acrylic Adhesives on a Graphene Substrate with Roughness. *BioNanoScience*, **2016**, 6, 177-184	3.4	4
349	Conformation Transitions of Recombinant Spidroins via Integration of Time-Resolved FTIR Spectroscopy and Molecular Dynamic Simulation. *ACS Biomaterials Science and Engineering*, **2016**, 2, 1298-1308	5.5	17
348	Printing of stretchable silk membranes for strain measurements. *Lab on A Chip*, **2016**, 16, 2459-66	7.2	80
347	Nanomechanics of silk: the fundamentals of a strong, tough and versatile material. *Nanotechnology*, **2016**, 27, 302001	3.4	36
346	The Effective Modulus of Random Checkerboard Plates. *Journal of Applied Mechanics, Transactions ASME*, **2016**, 83,	2.7	2
345	Secondary Structure Transition and Critical Stress for a Model of Spider Silk Assembly. *Biomacromolecules*, **2016**, 17, 427-36	6.9	51
344	Delivering Single-Walled Carbon Nanotubes to the Nucleus Using Engineered Nuclear Protein Domains. *ACS Applied Materials & Interfaces*, **2016**, 8, 3524-34	9.5	24
343	Categorical prototyping: incorporating molecular mechanisms into 3D printing. *Nanotechnology*, **2016**, 27, 024002	3.4	5
342	The nature of the silicaphilic fluorescence of PDMPO. *Physical Chemistry Chemical Physics*, **2016**, 18, 5938-48	3.8	9
341	Three-Dimensional-Printing of Bio-Inspired Composites. *Journal of Biomechanical Engineering*, **2016**, 138, 021006	2.1	74

340	Bone-Inspired Materials by Design: Toughness Amplification Observed Using 3D Printing and Testing . *Advanced Engineering Materials*, **2016**, 18, 1354-1363	3.5	99
339	Design of Multistimuli Responsive Hydrogels Using Integrated Modeling and Genetically Engineered Silk-Elastin-Like Proteins. *Advanced Functional Materials*, **2016**, 26, 4113-4123	15.6	57
338	Optimization of Composite Fracture Properties: Method, Validation, and Applications. *Journal of Applied Mechanics, Transactions ASME*, **2016**, 83,	2.7	46
337	Roadmap across the mesoscale for durable and sustainable cement paste – A bioinspired approach. *Construction and Building Materials*, **2016**, 115, 13-31	6.7	34
336	Ultrathin Free-Standing Bombyx mori Silk Nanofibril Membranes. *Nano Letters*, **2016**, 16, 3795-800	11.5	113
335	Integrated multiscale biomaterials experiment and modelling: a perspective. *Interface Focus*, **2016**, 6, 20150098	3.9	6
334	Strength and fracture toughness of heterogeneous blocks with joint lognormal modulus and failure strain. *Journal of the Mechanics and Physics of Solids*, **2016**, 92, 72-86	5	2
333	Biomimetic additive manufactured polymer composites for improved impact resistance. *Extreme Mechanics Letters*, **2016**, 9, 317-323	3.9	81
332	Atomically Sharp Crack Tips in Monolayer MoS and Their Enhanced Toughness by Vacancy Defects. *ACS Nano*, **2016**, 10, 9831-9839	16.7	91
331	Large Deformation Mechanisms, Plasticity, and Failure of an Individual Collagen Fibril With Different Mineral Content. *Journal of Bone and Mineral Research*, **2016**, 31, 380-90	6.3	40
330	Probability distribution of fracture elongation, strength and toughness of notched rectangular blocks with lognormal Young's modulus. *Journal of the Mechanics and Physics of Solids*, **2015**, 84, 116-129	5	8
329	Nonlinear Viscous Water at Nanoporous Two-Dimensional Interfaces Resists High-Speed Flow through Cooperativity. *Nano Letters*, **2015**, 15, 3939-44	11.5	37
328	Mechanical Properties and Failure of Biopolymers: Atomistic Reactions to Macroscale Response. *Topics in Current Chemistry*, **2015**, 369, 317-43		12
327	Random Bulk Properties of Heterogeneous Rectangular Blocks With Lognormal Young's Modulus: Effective Moduli. *Journal of Applied Mechanics, Transactions ASME*, **2015**, 82,	2.7	11
326	Structural optimization of 3D-printed synthetic spider webs for high strength. *Nature Communications*, **2015**, 6, 7038	17.4	107
325	Origami: Folding creases through bending. *Nature Materials*, **2015**, 14, 366-8	27	15
324	Defect-Tolerant Bioinspired Hierarchical Composites: Simulation and Experiment. *ACS Biomaterials Science and Engineering*, **2015**, 1, 295-304	5.5	57
323	The tail domain of lamin B1 is more strongly modulated by divalent cations than lamin A. *Nucleus*, **2015**, 6, 203-11	3.9	4

322	Directed self-assembly of end-functionalized nanofibers: from percolated networks to liquid crystal-like phases. *Nanotechnology*, **2015**, 26, 205602	3.4	5
321	Crumpling deformation regimes of monolayer graphene on substrate: a molecular mechanics study. *Journal of Physics Condensed Matter*, **2015**, 27, 345401	1.8	14
320	Matriarch: A Python Library for Materials Architecture. *ACS Biomaterials Science and Engineering*, **2015**, 1, 1009-1015	5.5	6
319	Silk-Its Mysteries, How It Is Made, and How It Is Used. *ACS Biomaterials Science and Engineering*, **2015**, 1, 864-876	5.5	63
318	Molecular deformation mechanisms of the wood cell wall material. *Journal of the Mechanical Behavior of Biomedical Materials*, **2015**, 42, 198-206	4.1	57
317	Molecular asphaltene models based on Clar sextet theory. *RSC Advances*, **2015**, 5, 753-759	3.7	61
316	Solving the Controversy on the Wetting Transparency of Graphene. *Scientific Reports*, **2015**, 5, 15526	4.9	24
315	Structure-mechanics relationships of collagen fibrils in the osteogenesis imperfecta mouse model. *Journal of the Royal Society Interface*, **2015**, 12, 20150701	4.1	37
314	Influence of cross-link structure, density and mechanical properties in the mesoscale deformation mechanisms of collagen fibrils. *Journal of the Mechanical Behavior of Biomedical Materials*, **2015**, 52, 1-13	4.1	205
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