

## Zhao Qin, Ph. D.

Department of Civil and Environmental Engineering, Massachusetts Institute of Technology, 77 Mass. Ave.  
Room 1-239, Cambridge, MA, 02139

Phone: 617-999-6883

E-mail: [qinzhao@mit.edu](mailto:qinzhao@mit.edu)

Homepage: <http://www.zhaoqinresearch.com/>

### Professional Preparation

Massachusetts Institute of Technology	Civil and Environmental Engineering	Research Scientist, till now
Massachusetts Institute of Technology	Civil and Environmental Engineering	Postdoctoral Associate, 2013
Massachusetts Institute of Technology	Civil and Environmental Engineering	Ph.D., 2013
Tsinghua University	Engineering Mechanics	M.Eng., 2008
Tsinghua University	Engineering Mechanics	B. Eng., 2006

**Major Field of Interest:** Comparative study of multiple biological materials and application of their multiscale computational models for investigating fundamental material functions and failing mechanisms at different length scales in different physical and chemical environments. Applying the knowledge to designs of synthetic composite materials with multiple advanced material functions by combining polymer matrix with novel low dimensional materials as well as by utilizing advanced digital manufacturing tools. Developing rigorous principles to efficiently optimize the material functions by integrating simulations with experiments and making the designs more suitable for mechanical, energy, electronic, biomedical or multiple of these applications.

### Professional Experience

2013 Jul.-Now	Research Scientist, Civil and Environmental Engineering, MIT
2013 Feb.-2013 Jun.	Postdoctoral Teaching Fellow, Civil and Environmental Engineering, MIT
2013 Feb.-2013 Jul.	Postdoctoral Associate, Laboratory for Atomistic and Molecular Mechanics in Civil and Environmental Engineering, MIT
2008-2013 Feb.	Research Assistant, Laboratory for Atomistic and Molecular Mechanics in Civil and Environmental Engineering, MIT
2005-2008	Research Assistant, Lab of Failure Mechanics in Engineering Mechanics, Tsinghua University
2004-2005	Graduate Research Assistant, Lab of Turbulence in Engineering Mechanics, Tsinghua University

**List of Publications** (55+ peer reviewed articles, 650+ citations, h-index=14)

### Representative papers:

1. **Zhao Qin**, Gang Seob Jung, Min Jeong Kang, Markus J. Buehler (2016), The mechanics and design of light-weight three-dimensional graphene assembly, *Science Advances*, in submission
2. Shengjie Ling, **Zhao Qin** (co-first author), Wenwen Huang, Sufeng Chao, David L. Kaplan, Markus J. Buehler (2016), Biomimetic multilayer water purification membranes, *Nature Nanotechnology*, in submission
3. Shanshan Wang, **Zhao Qin** (co-first author), Gang Seob Jung, Francisco J. Martin-Martinez, Kristine Zhang, Markus J. Buehler, Jamie H. Warner (2016), Atomically Sharp Crack Tip Propagation in Monolayer MoS<sub>2</sub>, in submission
4. Jared L. Zitnay, Yang Li, **Zhao Qin**, Boi-Hoa San, Baptiste Depalle, Shawn P. Reese, Markus J. Buehler, S. Michael Yu, and Jeffrey A. Weiss (2016), Molecular Level Detection and Localization of Mechanical

- Damage in Collagen Enabled by Collagen Hybridizing Peptides, *Nature Communications*, in submission
5. Yanlei Wang, **Zhao Qin** (Corresponding author), Markus J. Buehler, Zhiping Xu (2016), Intercalated Water Layers Promote Thermal Dissipation at Bio-Nano Interfaces, *Nature Communications*, in press
  6. **Zhao Qin**, Brett Compton, Jennifer A. Lewis and Markus J. Buehler (2015), Structural optimization of 3D-printed synthetic spider webs for high strength, *Nature Communications*, Vol 6, paper #: [7038 MIT NEWS](#)
  7. **Zhao Qin** (Corresponding author) and Markus J. Buehler (2015), Nonlinear Viscous Water at Nanoporous Two-Dimensional Interfaces Resists High-Speed Flow through Cooperativity, *Nano Letters*, Vol 15, pp [3939–3944](#)
  8. **Zhao Qin**, Michael Taylor, Mary Hwang, Katia Bertoldi and Markus J. Buehler (2014), Effect of wrinkles on the surface area of graphene: toward the design of nanoelectronics, *Nano Letters*, Vol 14, pp. [6520–6525](#)
  9. **Zhao Qin**, and Markus J. Buehler (2014), Molecular mechanics of mussel adhesion proteins, *Journal of the Mechanics and Physics of Solids*, Vol 62, pp. [19-30](#)
  10. **Zhao Qin**, and Markus J. Buehler (2013), Impact tolerance in mussel thread networks by heterogeneous material distribution, *Nature Communications*, Vol 4, paper #: [2187 Nature](#), [MIT NEWS](#), [NBC NEWS](#)
  11. **Zhao Qin**, and Markus J. Buehler (2013), Webs measure up, *Nature Materials*, Vol 12 (3), pp. [185-187](#)
  12. **Zhao Qin**, Alfonso Gautieri, Arun K. Nair, Hadass inbar, and Markus J. Buehler (2012), The thickness of hydroxyapatite nanocrystal controls the mechanical property of collagen-hydroxyapatite interface, *Langmuir*, Vol. 28 (4), pp. [1982-1992](#)
  13. **Zhao Qin**, Markus J. Buehler (2010). Molecular Dynamics Simulation of the alpha-Helix to beta-Sheet Transition in Coiled Protein Filaments: Evidence for a Critical Filament Length Scale, *Physical Review Letters*, Vol. 104(19), paper #: [198304 Story Movie](#)

#### **Other peer reviewed papers:**

14. Flavia Libonati, Grace X. Gu, Zhao Qin, Laura Vergani, Markus J. Buehler (2015), Bone-inspired composite: Design, 3D printing and Testing, *Advanced Engineering Materials*, in submission
15. Grace Xiang Gu, Isabelle Su, Shruti Sharma, Jamie L Voros, **Zhao Qin**, Markus Buehler (2015), 3D-printing of bio-inspired composites, *JBME*, in submission
16. Baptiste Depalle, **Zhao Qin**, Sandra J. Shefelbine and Markus J. Buehler (2015), Large Deformation Mechanisms, Plasticity and Failure of an Individual Collagen Fibril with Different Mineral Content, *Journal of Bone and Mineral Research*, [doi: 10.1002/jbmr.2705](#)
17. GangSeob Jung, **Zhao Qin**, Markus J. Buehler (2015), Mechanical Properties and Failure of Biopolymers: Atomistic Reactions to Macroscale Response, *Topics in Current Chemistry*, Vol 369, pp. [317-343](#)
18. Talal Al-Mulla, **Zhao Qin** and Markus J Buehler (2015), Crumpling deformation regimes of monolayer graphene on substrate: a molecular mechanics study, *Journal of Physics: Condensed Matter*, Vol 27, paper #: [345401](#)
19. **Zhao Qin**, Zhiping Xu and Markus J. Buehler (2015), Peeling Silicene from an Interface with Silver Substrates, *Journal of Applied Mechanics*, Vol 82, paper #: [101003](#)
20. Sairaam Ganesh, **Zhao Qin**, Stephen T. Spagnol, Matthew T. Biegler, Kelli A. Coffey, Agnieszka Kalinowski, Markus J. Buehler, Kris Noel Dahl (2015), The tail domain of lamin B1 is more strongly modulated by divalent cations than lamin A, *Nucleus*, Vol 6, pp. [203-11](#)
21. GangSeob Jung, **Zhao Qin**, Markus J. Buehler (2015), Molecular mechanics of polycrystalline graphene with enhanced fracture toughness, *Extreme Mechanics Letters*, Vol 2, pp. [52-59](#)
22. Reza Mirzaeifar, Leon Dimas, **Zhao Qin**, Markus J. Buehler (2015), Defect-tolerant Bioinspired

- Hierarchical Composites: Simulation and Experiment, *ACS Biomaterials*, Vol 1, pp. [295–304](#)
23. Reza Mirzaeifar, **Zhao Qin**, Markus J. Buehler (2015), Mesoscale Mechanics of Twisting Carbon Nanotube Yarns, *Nanoscale*, Vol 7, pp. [5435-5445](#)
  24. Kai Jin, **Zhao Qin**, and Markus J. Buehler (2014), Molecular deformation mechanisms of the wood cell wall material, *JMBBM*, Vol 42, pp. [198–206](#)
  25. Wen Yang, Vincent Sherman, Bernd Gludovatz, Mason Mackey, Elizabeth A. Zimmermann, Edwin H. Chang, Eric Schaible, **Zhao Qin**, Markus J. Buehler, Robert O. Ritchie, Marc A. Meyers (2014), Protective Role of Arapaima Scales: Structure and Mechanical Behavior, *Acta Biomaterialia*, Vol 10, pp. [3599-3614](#)
  26. Reza Mirzaeifar, **Zhao Qin** and Markus J Buehler (2014), Tensile strength of carbyne chains in varied chemical environments and structural lengths, *Nanotechnology*, Vol 25, paper #: [371001](#)
  27. **Zhao Qin**, Nicola M. Pugno and Markus J. Buehler (2014), Mechanics of fragmentation of crocodile skin and other thin films, *Scientific Reports*, Vol 4, paper #: [4966](#)
  28. Max Solar, **Zhao Qin**, Markus J. Buehler (2014), Molecular Dynamics Simulations of Crosslinked Amorphous Polymer Adhesives, *Journal of Materials Research*. Vol 29, pp. [1077-1085](#)
  29. Baptiste Depalle, **Zhao Qin**, Sandra Shefelbine, Markus J. Buehler (2014), Influence of cross-links in the mesoscale deformation mechanisms of collagen fibrils, *JMBBM*, [doi:10.1016/j.jmbbm.2014.07.008](#)
  30. **Zhao Qin**, Leon Dimas, David Adler, Graham Bratzel, Markus J. Buehler (2014), Biological materials by design, *J. Phys.: Condens. Matter*, Vol 26, paper #: [073101](#)
  31. Agnieszka Kalinowski, Peter N. Yaron, **Zhao Qin**, Siddharth Shenoy, Markus J. Buehler, Mathias Lösche, Kris N. Dahl (2014), Interfacial binding and aggregation of lamin A tail domains associated with Hutchinson-Gilford progeria syndrome, *Biophysical Chemistry*, Vol 195, pp. [43–48](#)
  32. Graham Bratzel, **Zhao Qin** and Markus J. Buehler (2013), Viscoelastic relaxation time and structural evolution during length contraction of spider silk protein nanostructures, *MRS Communications*, Vol 3, pp. [185-190](#)
  33. Agnieszka Kalinowski, **Zhao Qin**, Kelli Coffe, Ravi Kodali, Markus J. Buehler, Mathias Lösche, Kris Noel Dahl (2013), Calcium causes a conformational change in lamin A tail domain that promotes farnesylmediated membrane association, *Biophysical Journal*, Vol 104 (10), pp. [2246-2253](#)
  34. **Zhao Qin**, and Markus J. Buehler (2013), Bio-inspired graphene nano-gut, *Journal of Applied Mechanics*, Vol 80, paper #: [061009](#) (Best paper award of the year, ASME)
  35. **Zhao Qin**, Andrea Fabre and Markus J. Buehler (2013), Structure and mechanism of maximum stability of alpha helical protein domains at a critical length scale, *The European Physical Journal E*, Vol 36, paper #: [53](#).
  36. Greta Gronau, **Zhao Qin**, Markus J. Buehler (2013), Effect of sodium chloride on the structure and stability of spider silk's N-terminal protein domain, *Biomaterials Science*, Vol 1 (3), pp. [276-284](#) ([Cover article](#))
  37. **Zhao Qin**, and Markus J. Buehler (2012), Cooperativity governs the size and structure of biological interfaces, *Journal of Biomechanics*, Vol 45 (16), pp. [2778-2783](#).
  38. **Zhao Qin**, and Markus J. Buehler (2012), Carbon dioxide enhances fragility of ice crystals, *Journal of Physics D: Applied Physics*, Vol. **45** (44), paper #: [445302](#) [Scientific American](#)
  39. **Zhao Qin**, and Markus J. Buehler (2012), Computational and theoretical modeling of intermediate filament networks: structure, mechanics and related disease, *Acta Mechanica Sinica*, Vol. 28 (4), pp. [941-950](#)
  40. **Zhao Qin**, Markus J. Buehler (2012). Molecular mechanics of dihydroxyphenylalanine at a silica interface. *Applied Physics Letters*, Vol. 101 (8), paper #: [083702](#)
  41. Arun K. Nair, **Zhao Qin**, and Markus J. Buehler (2012), Cooperative deformation of carboxyl groups in

- functionalized carbon nanotubes, *International Journal of Solids and Structures*, Vol. 49 (18), pp. [2418-2423](#).
42. **Zhao Qin**, and Markus J. Buehler (2012), Bioinspired design of functionalised graphene, *Molecular Simulation*, Vol. 38 (8), pp. [695-703](#)
  43. **Zhao Qin**, and Markus J. Buehler (2012), Mechanical property of crosslink controls the failure mechanism of intermediate filament network under tension, *Theoretical & Applied Mechanics Letters*, Vol. 2(1), paper #: [014005](#)
  44. **Zhao Qin**, Agnieszka Kalinowski, Kris Noel Dahl, Markus J. Buehler (2011), Structure and stability of the lamin A tail domain and HGPS mutant, *Journal of Structural Biology*, Vol. 175(3), pp. [425-433](#). [Faculty of 1000](#), [Science Daily](#)
  45. **Zhao Qin** and Markus J. Buehler (2011). Dynamic failure of a nuclear lamina meshwork under extreme mechanical deformation, *BioNanoScience*, Vol. 1(1), pp. [14-23](#)
  46. **Zhao Qin** and Markus J. Buehler (2011). Flaw tolerance of nuclear intermediate filament lamina under extreme mechanical deformation, *ACS Nano*, Vol. 5(4), pp. [3034-3042](#) [Ask Nature](#)
  47. Melis Arslan, **Zhao Qin** and Markus J. Buehler (2011). Coiled-coil intermediate filament stutter instability and molecular unfolding, *Computational Methods in Biomechanics and Biomedical Engineering*, Vol. 14(5), pp. [483-489](#)
  48. **Zhao Qin**, Markus J. Buehler (2011). Structure and dynamics of human vimentin intermediate filament dimer and tetramer: Comparison between explicit and implicit solvent molecular dynamics, *Journal of Molecular Modeling*, Vol. 17(1), pp. [37-48](#)
  49. **Zhao Qin**, Markus J. Buehler (2010). Cooperative deformation of hydrogen bonds in beta-strands and beta-sheet nanocrystals, *Physical Review E*, Vol. 82(6), paper #: [061906](#)
  50. Robert Kirmse, **Zhao Qin**, Carl M. Weinert, Andreas Hoenger, Markus J. Buehler, Laurent Kreplak (2010). Plasticity of Intermediate Filament Subunits, *PLoS ONE*, Vol. 5(8), paper #: [e12115](#)
  51. J'ér'emie Bertaud, **Zhao Qin** and Markus J. Buehler (2010). Intermediate filament-deficient cells are mechanically softer at large deformation: a multi-scale simulation study, *Acta Biomaterialia*, Vol. 6(7), pp. [2457-2466](#)
  52. **Zhao Qin**, Markus J. Buehler, Laurent Kreplak (2010). A multi-scale approach to understand the mechanobiology of intermediate filaments, *Journal of Biomechanics*, Vol. 43(1), pp. [15-22](#)
  53. **Zhao Qin**, Laurent Kreplak, Markus J. Buehler (2009). Hierarchical Structure Controls Nanomechanical Properties of Vimentin Intermediate Filaments. *PLoS ONE*, Vol. 4(10), paper #: [e7294](#) [Nano Werk](#)
  54. **Zhao Qin**, Laurent Kreplak, Markus J. Buehler (2009). Nanomechanical properties of vimentin intermediate filament dimers, *Nanotechnology*, Vol. 20(42), paper #: [425101](#) [Nanotech web](#),
  55. J'ér'emie Bertaud, **Zhao Qin** and Markus J. Buehler (2009). Atomistically Informed Mesoscale Model of Alpha-Helical Protein Domains, *International Journal for Multiscale Computational Engineering*, Vol. 7(3), pp. [237-250](#)
  56. J'ér'emie Bertaud, **Zhao Qin** and Markus J. Buehler (2009). Amino acid sequence dependence of nanoscale deformation mechanisms in alpha-helical protein filaments. *Journal of Strain Analysis*, Vol. 44(7), pp. [517-531](#)
  57. **Zhao Qin**, Steven Cranford, Theodor Ackbarow, Markus J. Buehler (2009) Robustness-strength performance of hierarchical alpha-helical protein filaments, *International Journal of Applied Mechanics*, Vol. 1(1), pp. [85-112](#) ([Cover Article](#) and Best paper of the year) [Nanotech-Now](#)
  58. **Zhao Qin**, Xi-Qiao Feng, Jian Zou and Yajun Yin (2008). Molecular dynamics simulations of deformation and rupture of super carbon nanotubes under tension. *Journal of Nanoscience and Nanotechnology*, Vol. 8(12), pp. [6274-6282](#)
  59. **Zhao Qin**, Jian Zou and Xi-Qiao Feng (2008), Influence of Water on the Frequency of Carbon Nanotube

Oscillators, *Journal of Computational and Theoretical Nanoscience*, Vol. 5(7), pp. [1403-1407](#) (Cover Article)

60. **Zhao Qin**, Qing-Hua Qin, Xi-Qiao Feng (2008), Mechanical property of carbon nanotubes with intramolecular junctions: Molecular dynamics simulations, *Physics Letters A*, Vol. 372(44), pp. [6661-6666](#)
61. **Zhao Qin**, Xi-Qiao Feng, Jian Zou, Yajun Yin and Shou-Wen Yu (2007). Superior flexibility of super carbon nanotubes: Molecular dynamics simulations. *Applied Physics Letters*, Vol. 91(4), paper #: [043108](#)

### **Book Chapters:**

62. **Zhao Qin**, Chia-Ching Chou, Laurent Kreplak and Markus J. Buehler (2011). Structural mechanics and functional properties of intermediate filaments from the atomistic to the cellular scales. Chapter 4 in *Advances in Cell Mechanics*, edited by Shaofan Li and Bohua Sun, published by Springer-Verlag.
63. Arun K. Nair, Flavia Libonati, **Zhao Qin**, Leon S. Dimas, and Markus J. Buehler (2014), "Mechanical and interface properties of biominerals: Atomistic to coarse grained modeling," Chapter 4 in *Biomineralization Handbook: Characterization of biomineral and biomimetic materials*, edited by Elaine DiMasi and Laurie B. Gower, published by CRC Press.

### **Presentations and Activities**

#### **1. Invited Talks:**

- Multiscale Computational Modeling of Fibrous Materials: design, manufacture and optimization, Squishy Physics Seminar Series, Harvard University, 2015 May 13
- Multiscale Computational Optimization and Additive Manufacturing for Functional Material Design, Radcliffe Institute for Advanced Study, Harvard University, 2014
- Bottom-up Design of the Structure and Mechanics of Interfacial Materials, 2014 AmeriMech Symposium, Virginia Tech, 2014; 7th World Congress of Biomechanics (WCB), Boston, 2014
- Functional Amyloids: From Weakness to Strength, FASEB meeting, Big Sky, Montana, 2013
- Multi-scale Modeling of Protein Materials and Their Mechanics, Interdisciplinary Symposium on Advanced Nano/Biosystems, University of Illinois at Urbana-Champaign, 2013
- Molecular Mechanics of Vimentin and Lamin Protein Networks, Society of Engineering Science, Brown University School of Engineering, 2013 Jul. 18 – Jul. 31

#### **2. Recent Conference and Presentations**

- Presentation, "Bioinspired materials achieved by design, optimization and manufacturing", Waikoloa, HI, 2015, Dec.
- Presentation, "Multiscale modelling of structure-mechanics relationships of biological fibrous materials", Waikoloa, HI, 2015, Dec.
- Presentation, "Designs of Nanoporous Materials for High-Speed Water Filtration by Considering Nonlinear Viscosity of Water at Interfaces", Materials Research Society (MRS), Boston, 2015, Dec.
- Presentation, "Multiscale computational modeling of collagen fibrils", TERMIS World Congress, Boston, 2015, Sept. 9
- Presentation, "Molecular mechanics of the mussel glue adhesion on a silica surface", ASME Global Congress on Nano Engineering for Medicine and Biology, Boston, MA, 2013, Feb. 4 – Feb. 6
- Poster, "Multiple-scale structure and mechanics of intermediate filament networks", Gordon Research Conference (GRC): Intermediate Filaments, Lewiston, ME, 2012
- Presentation, "Bottom-up study of flaw tolerance properties of protein networks", American Physical Society (APS) March, Boston, MA, 2012
- Presentation, "The molecular mechanism of rapid aging disease: insights into the structural and mechanical stability of the normal lamin A and its mutant", Material Research Society (MRS) Fall

Meeting, Boston, MA, 2011

### **3. Service in Academia**

- Symposium Chair, 7th World Congress of Biomechanics (WCB), Boston, 2014
- Session Organizer, ASME Global Congress on Nano Engineering for Medicine and Biology: Track 7: Natural, Biomimetic and Bioinspired Materials and Structures, Boston, MA, Feb. 6, 2013
- Co-Chair, Engineering Mechanics Institute (EMI) Annual Conference: Symposium 5: Mechanics of Biological and Biologically Inspired Materials, Northeastern University, Boston, MA, 2011

### **Mentoring and Teaching Activities**

#### **Teaching in Class**

- Spring 2013, Teaching the class 3.021J/1.021J/10.333J/18.361J/22.00J “Introduction to Modeling and Simulation” (with J. Grossman/Department of Materials Science and Engineering and M. Buehler/Department of Civil and Environmental Engineering) (evaluation 5.8 out of 7).

#### **As mentor of undergraduate/K-12 students**

- Fall 2015, Research Mentor for MIT UROP freshman student Jacob J Higgins on the project of automatic 3D scanning of 3D spider web.
- Summer 2015, Research Mentor for MIT UROP student Shruti Sharma and Jamie L Voros on the project of 3D printing of hydroxyapatite.
- Summer 2015, Research Mentor for high school student Ersin Arioglu on the project of silk mechanics under ultralow temperature.
- Summer 2015, Research Mentor for Research Scholar Institute (RSI) for K-12 students, mentoring the high school student Kristine Zhang, who won the top 10 prize (out of 70) on the project of MoS<sub>2</sub> mechanics.
- Spring 2015, Research Mentor for senior student CAPSTONE project of Santé Nyambo, Yvonne Wangare and Billy Ndengeyingoma on the project of 3D spider web scanning.
- Summer 2014, Research Mentor for RSI mentoring the high school student Phillip Yu, on the project of spider web modeling and Berfin Gögercin on the project of water filtering.
- Spring 2014, Research Mentor for MIT CEE Master of Engineering student, Bogdan Demian on the project of 3D spider web modeling.
- Spring 2014, Research Mentor for MIT UROP student Mary Hwang from Civil and Environmental Engineering (CEE) on the project of graphene wrinkling.
- Summer 2011, Research Mentor for Research Scholar Institute (RSI) for K-12 students, mentoring the 3<sup>rd</sup> year high school student Hadass Inbar, who won the top 10 prize (out of 70), on the project of collagen/hydroxyapatite modeling.
- 2010-2011, Research Mentor for MIT Undergraduate Research Opportunities Program (UROP) sophomore undergraduate student Andrea Fabre from Bio-Chemical Engineering, on the project of alpha helix stability.

#### **Honors and Awards**

1. Best paper award in Journal of Applied Mechanics (ASME) for the paper “Bioinspired Graphene Nanogut” among papers published during 2012~2013.
2. Outstanding Paper Award, ASME Global Congress on Nano Engineering for Medicine and Biology, Boston, MA, 2013
3. Chinese Government Award For Outstanding Self-Financed Students Abroad, 2011, NY, 2011
4. Scholarship, BioNanotechnology Summer Institute, UIUC, IL, 2011
5. Finalist, Student Award “Y. C. Fung student paper on biomechanics, biophysics and biomateriomics”, EMI Annual Conference, Northeastern University, MA, 2011
6. Best Paper Award, International Journal of Applied Mechanics (Imperial College Press) 2010

7. NSF fellowship, short course “Mechanics of Soft Materials”, Chicago, IL, 2010
8. Schoettler Graduate Fellowship, Civil and Environmental Engineering, MIT, 2010
9. SAMSUNG Scholarship, Tsinghua University, China, 2007
10. 2nd Rank National Scholarship, Tsinghua University, China, 2003

### **Research News Highlights**

“Translating thought to print”, [MIT NEWS](#), 2015, May

“Super-strong mussel fibers could inspire earthquake-proof buildings”, [NBCNEWS](#), [MIT NEWS](#), [Nature](#), 2013 Aug.

“Atomistic simulation combines with experiment to reveal nanomechanics of mutant proteins in disease”, MIT [CEE News](#) and [On Balance](#), 2011 Sep.

“Nanoscale hierarchies are crucial for extreme stretchiness of intermediate filaments”, [Nanowork](#), 2009 Oct.

“Simplicity is Crucial to Design Optimization at Nanoscale”, [NSF News From the Field](#), 2009 Feb.

### **Collaborators**

Collaborators: Laurent Kreplak (Dalhousie University, CA), Nicola Pugno (U. of Trento, Italy), David Kaplan (Tufts University), Kris Dahl (Carnegie Mellon Univ.), Kristie Koski (Brown University), Marta Pappalardo (Pisa University, Italy), Sandra Shefelbine (Northeastern University), Marc Meyers (UCSD), Zhiping Xu (Tsinghua University, China), Jennifer Lewis (Harvard University), Katia Bertoldi (Harvard University), Flavia Libonati (Politecnico di Milano, Italy), Jamie H. Warner (University of Oxford, UK), S. Michael Yu (University of Utah), Jeffrey A. Weiss (University of Utah), Guy Genin (Washington University in St. Louis)

Thesis Advisor and Postgraduate-Scholar Sponsors: Xi-Qiao Feng, Tsinghua University (B. S. and M.S. advisor); Markus Buehler (Ph.D. and postdoctoral advisor).

### **Funds & Grants**

MIT-CHINA grant (Co-PI, ‘Interfacial Engineering For Thermal Management in Nanoelectronics and Biological Materials’)

MIT-UNIPI grant (Co-PI, ‘Assessing the Effect of Biota on Coastal Rock Surfaces: a Quantitative Approach’)

NSF XSEDE supercomputing grant (Co-PI, ‘Bottom-up Materiomics Study of Hierarchical Protein Materials’)