Yang Jiao

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Education:

- Princeton University, Princeton, NJ — Sep. 2005 - Aug. 2010
  Ph.D., Department of Mechanical and Aerospace Engineering
- Peking University, Beijing, China — Sep. 2001 - Jul. 2005
  B.E., Department of Mechanics and Engineering Science

Work Experience:

- Assistant Professor, Arizona State University, Tempe, AZ — Staring in Spring 2013
  Materials Science and Engineering
- Postdoctoral Research Associate, Princeton University, Princeton, NJ — Sep. 2010 – Present
  Physical Science in Oncology Center, Princeton Institute for the Science and Technology of Materials
- Graduate Research Assistant, Princeton University, Princeton, NJ — Jun. 2006 - Aug. 2010

Research Interests:

- Designing advanced materials for energy-related applications
- Microstructure and macroscopic properties of heterogeneous materials and biomaterials
- Self-assembly of anisotropic particles
- Structure and properties of disordered jammed granular materials
- Understanding in vivo dynamics of biological cells via multi-scale simulations
- Modeling growth, invasion and metastasis of solid tumor in heterogeneous microenvironments
- Cancer treatment optimization

Awards and Honors:

- Ray Grimm Prize in Computational Physics, 2010
- Chinese Government Award for Outstanding Self-Financed Student Abroad, 2010
- Gordon Wu Prize for Excellence, Princeton University, 2009
- Martin Summerfield Memorial Fellowship, 2006
- Princeton University Graduate Fellowship, 2005
- Outstanding Graduate of Peking University, 2005
- Chinese Academy of Sciences Fellowship, 2004

Professional Service and Membership:

- Journal reviewer: Nature, Soft Matter, Langmuir, Journal of Physical Chemistry, Journal of Statistical Mechanics, Journal of Physics: Condensed Matter, Europhysics Letters, Proceedings of the Royal Society A, Advances in Water Resources, Computational Optimization and Applications
- Member of the American Physical Society and Material Research Society.

Peer-Reviewed Journal Publications:

1. H. L. Duan, Y. Jiao, X. Yi, J. Wang and Z. P. Huang
   Solutions of Inhomogeneity Problems with Graded Shells and Application to Core-Shell Nano-particles and Composites.
   Journal of the Mechanics and Physics of Solids 54, 1401 (2006)

2. Y. Jiao, F. H. Stillinger and S. Torquato
   Modeling Heterogeneous Materials via Two-Point Correlation Functions: Basic Principles.
   Physical Review E 76, 031110 (2007)

3. Y. Jiao, F. H. Stilinger and S. Torquato
   Modeling Heterogeneous Materials via Two-Point Correlation Functions II: Algorithmic Details and Applications.
   Physical Review E 77, 031135 (2008)

4. Y. Jiao, F. H. Stillinger and S. Torquato
   Optimal Packings of Superdisks and the Role of Symmetry
   Physical Review Letters 100, 245504 (2008)

5. Y. Jiao, F. H. Stillinger and S. Torquato
   Dense Packings of Superballs
   Physical Review E 79, 041309 (2009)

6. S. Torquato and Y. Jiao
   Dense Packings of Platonic and Archimedean Solids
   Nature 460, 876 (2009)
   [The **featured Nature Cover Story** of Aug. 13, 2009 issue.]

7. Y. Jiao, F. H. Stillinger and S. Torquato
   A Superior Descriptor of Random Textures and Its Predictive Capacity
   Proceedings of the National Academy of Sciences USA 106, 17634 (2009)

8. S. Torquato and Y. Jiao
   Dense Packings of Polyhedra: Platonic and Archimedean Solids
   Physical Review E 80, 041104 (2009)

9. Y. Jiao, F. H. Stillinger and S. Torquato
   Geometrical Ambiguity of Pair Statistics: Point Configurations
   Physical Review E 81, 011105 (2010)

10. Y. Jiao, F. H. Stillinger and S. Torquato
    Distinct Features of Maximally Random Jammed States of Superballs
    Physical Review E 81, 041304 (2010)
    [Figure 7(b) was selected as the “Kaleidoscope Image” by Physical Review E]

11. S. Torquato and Y. Jiao
    Exact Constructions of a Family of Dense Periodic Packings of Tetrahedra
    Physical Review E 81, 041310 (2010)

12. Y. Jiao, F. H. Stillinger and S. Torquato
Geometrical Ambiguity of Pair Statistics II: Random Media
Physical Review E 82, 011106 (2010)

13. S. Torquato and Y. Jiao
Robust Algorithm to Generate A Diverse Class of Ordered and Disordered Sphere Packings via Linear Programming
Physical Review E 82, 061302 (2010)

14. Y. Jiao, F. H. Stillinger and S. Torquato
Nonuniversality of Density and Disorder in Jammed Sphere Packings
Journal of Applied Physics 109, 013508 (2011)

15. C. Zachary, Y. Jiao and S. Torquato
Hyperuniformity Long-Range Correlations are a Signature of Disordered Jammed Hard-Particle Packings
Physical Review Letters 106, 178001 (2011)

16. C. Zachary, Y. Jiao and S. Torquato
Hyperuniformity, Quasi-Long-Range Correlations, and Void-Space Constraints in Maximally Random Jammed Particle Packings. I. Polydisperse Spheres
Physical Review E 83, 051133 (2011)

17. C. Zachary, Y. Jiao and S. Torquato
Hyperuniformity, Quasi-Long-Range Correlations, and Void-Space Constraints in Maximally Random Jammed Particle Packings. II. Anisotropy in Particle Shape
Physical Review E 83, 051308 (2011)

18. J. H. Conway, Y. Jiao and S. Torquato
A New Family of Tilings of Three-Dimensional Euclidean Space by Tetrahedra and Octahedra
Proceedings of the National Academy of Sciences USA 108, 11009 (2011)

19. A. Hopkins, Y. Jiao, F. H. Stillinger and S. Torquato
Phase Diagram and Structural Diversity of the Densest Binary Sphere Packings
Physical Review Letters 107, 125501 (2011)

20. Y. Jiao and S. Torquato
A Packing of Truncated Tetrahedra that Nearly Fills All of Space and its Melting Properties
Journal of Chemical Physics 135, 151101 (2011)
[**Featured on the cover** of October 17 issue of J. Chem. Phys.]

21. Y. Jiao and S. Torquato
Maximally Random Jammed Packings of Platonic Solids: Hyperuniform Long-Range Correlations and Isostaticity
Physical Review E 84, 041309 (2011)

22. Y. Jiao, H. Berman, T-R Kiehl and S. Torquato
Spatial Organization and Correlations of Cell Nuclei in Brain Tumors
PLoS One 6, e27323 (2011)

23. Y. Jiao and S. Torquato
Emergent Behavior from A Cellular Automaton Model for Invasive Tumor Growth in Heterogeneous Environments
PLoS Computational Biology 7, e1002314 (2011)

24. H. Cohn, Y. Jiao, A. Kumar and S. Torquato
Rigidity of Spherical Codes
Geometry and Topology 15, 2235 (2011)

25. Y. Jiao and S. Torquato
Diversity of Dynamics and Morphology of Invasive Solid Tumors
AIP Advances 2, 011003 (2012)
[**Invited paper** for the special issue on "Physics of Cancer".]

26. C. Gommes, Y. Jiao and S. Torquato
Density of States for a Specified Correlation Function and the Energy Landscape
Physical Review Letters 108, 080601 (2012)

27. Y. Jiao and S. Torquato
Quantitative Characterization of the Microstructure and Transport Properties of Biopolymer Networks
Physical Biology 9, 036009 (2012)

28. C. Gommes, Y. Jiao and S. Torquato
Microstructure Degeneracy Associated with a Two-Point Correlation Function and Its Information Content
Physical Review E 85, 051140 (2012)

29. S. Torquato and Y. Jiao
Organizing Principles for Dense Packings of Non-shperical Hard Particles: Not All Shapes Are Created Equal
Physical Review E, in press

30. S. Torquato and Y. Jiao
Effect of Dimensionality on the Continuum Percolation of Overlapping Hyperspheres and Hypercubes: II. Simulation Results and Analyses
Journal of Chemical Physics, under review

31. S. S. Singh, J. J. Williams, Y. Jiao and N. Chawla
Modeling Anisotropic Multiphase Heterogeneous Materials via Directional Correlation Functions: Simulations and Experimental Verification
Metallurgical and Materials Transactions A, under review

32. S. Atkinson, Y. Jiao and S. Torquato
Maximally Dense Packings of Two-Dimensional Convex and Concave Noncircular Particles
Physical Review E, in preparation

33. R. Gabberilli, Y. Jiao, and S. Torquato
Infinite Families of Tessellations of Space by Elementary Polyhedra via Retessellations of the FCC Tiling,
Physical Review E, in preparation

Recent Contributed Talks (Selected):

- Y. Jiao and S. Torquato, Dense Packings of the Platonic and Archimedean Solids.
  Invited talk at NSF MRSEC Meeting, New York University (Sep. 2009)
- Y. Jiao, Self-Assembly of Anisotropic Hard Particles.
  School of Engineering & Applied Science, Yale University (Feb. 2010)
- Y. Jiao, Exact Construction of A Family of Dense Tetrahedron Packings.
  103rd Statistical Mechanics Meeting, Rutgers University (May 2010)
- Y. Jiao, Towards the Optimal Packings of Tetrahedra and Other Platonic Solids.
  Invited talk at 2010 Optimal Conference, Vanderbilt University (May 2010)
- Y. Jiao and S. Torquato, A Robust Linear Programming Algorithm for Jammed Hard Sphere Packings.
  Invited talk at NSF MRSEC Meeting, New York University (Oct. 2010)
- Y. Jiao and S. Torquato, Statistical Structural Characterization of Cancer Cells.
  Physical Science in Oncology Center Seminar, Princeton University (Nov. 2010)
- Y. Jiao, Robust Linear Programming Algorithm for Jammed Hard Sphere Packings.
  Princeton/Penn/NYU Soft Matter Meeting, Princeton University (Dec. 2010)
- Y. Jiao, Cellular Automaton Model for Invasive Tumor Growth in Heterogeneous Environments.
  APS March Meeting, Dallas TX (Mar. 2011)
- Y. Jiao, Diversity of Growth Dynamics and Morphology of Invasive Solid Tumors.
  Physical Science in Oncology Center Seminar, Princeton University (Aug. 2011)
- Y. Jiao, Crystalline Assembly of Truncated Tetrahedra and its Melting Properties.
  Invited talk at NSF MRSEC Meeting, New York University (Oct. 2011)
- Y. Jiao, Diversity of Self-Organization of Colloidal Particles: Not All Shaped Are Created Equal.
  Invited talk at Princeton Center for Theoretical Science, Princeton University (Nov. 2011)
- Y. Jiao, Cellular Forces in 3D Invasion of Metastatic Cancer Cells *in vitro*.
  Physical Science in Oncology Center Seminar, Princeton University (Nov. 2011)
- Y. Jiao, Construction of A Dense Packing of Truncated Tetrahedra Nearly Filling All Space.
  104th Statistical Mechanics Meeting, Rutgers University (Dec 2011)
- Y. Jiao, Dense Packings of Truncated Tetrahedra and Their Melting Properties.
  APS March Meeting, Boston MA (Feb. 2012)
- Y. Jiao, Organizing Principles for Dense Packings of Nonspherical Hard Particles.
  Invited talk at ExxonMobil Corporate Strategic Research Lab, Clinton NY (April 2012)