

YANQING SU

Postdoctoral Scholar ◇ Department of Mechanical Engineering
Engineering II 2235 ◇ University of California, Santa Barbara, CA 93106-5070
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EDUCATION

- Ph.D., Geophysics** 2017
Minor in Civil and Environmental Engineering
Georgia Institute of Technology, Atlanta, GA
Advisor: Prof. Christian Huber (now at Brown University)
Dissertation: *Numerical study of the dynamic processes in volcanic eruptions: Bubble dynamics and volatiles diffusion*
- M.S., Computational Science and Engineering** 2016
Georgia Institute of Technology, Atlanta, GA
- M.S., Geophysics** 2012
University of Science and Technology of China, Hefei, China
Advisor: Prof. Quanming Lu
Thesis: *Ion acceleration at quasi-parallel collisionless bow shock of high Mach number*
- B.S., Geophysics** 2010
University of Science and Technology of China, Hefei, China

EMPLOYMENT

- Postdoctoral Scholar** 2018–present
Department of Mechanical Engineering
University of California, Santa Barbara, CA
Advisor: Prof. Irene J. Beyerlein
- Junior Specialist** 2017–2018
Department of Mechanical Engineering
University of California, Santa Barbara, CA

AWARDS

- Travel Fellowship, DowMI-MRL, UC Santa Barbara, 2020
- Registration Award, World Congress on High Entropy Alloys, 2019
- Scholarship, San Diego Supercomputer Center Summer Institute, 2019
- Travel Grant, Society of Exploration Geophysicists (SEG) Annual Meeting, 2016
- Outstanding Student Scholarship, Univ. Sci. Tech. China, 2006–2009

RESEARCH FUNDING AND PROPOSAL WRITING

- PI, *Ab-initio informed phase-field modeling of dislocations in $Co_{0.4}Ni_{0.4}Ru_{0.2}$ MPEAs*, NSF XSEDE #MSS190006, 300,000 SUs + 1,600 node hours (= \$12,504.86), 2019–2020
- Assisted with NSF DMR and DOE NNSA proposals writing, 2019 (PI: Irene J. Beyerlein)

RESEARCH EXPERIENCE

University of California, Santa Barbara

2017–present

- *Advanced the crystal plasticity fast Fourier transform-based full-field micromechanical model toward an accurate description of twin/twin interactions in magnesium*
 - Funded by NSF CMMI-1729887
 - Collaborated with M. Arul Kumar (LANL), Julie M. Schoenung (UC Irvine), and Subhash Mahajan (UC Davis)
- *Calculated generalized stacking fault energies and anti-phase boundary energies in dozens of metals and alloys via density functional theory*
 - Collaborated with Marko Knezevic (Univ. New Hampshire)
- *Analyzed plasticity in multi-principal element alloys via atomistic and phase-field modeling*
 - Funded by ONR BRC N00014-18-1-2392
 - Collaborated with Tresa Pollock (UC Santa Barbara)

Georgia Institute of Technology

2012–2017

- *Developed a bubble dynamics model for bubble growth, deformation, and coalescence, via the lattice Boltzmann method*
 - Funded by NSF EAR-1454821
 - Collaborated with Olivier Bachmann (ETH Zürich)
- *Quantified volatile diffusion in volcanic conduits via the finite volume method*
 - Funded by NSF EAR-1144957
 - Collaborated with Zoltán Zajacz (Univ. Toronto) and Heather Wright (U.S. Geological Survey)
- *Investigated dynamic response of saturated porous media via computational fluid mechanics*
 - Funded by ACS Petroleum Research Fund

University of Science and Technology of China

2010–2012

- *Modeled acceleration and heating of energetic particles in Earth's bow shocks via magnetohydrodynamics and the particle-in-cell method*
- *Analyzed data collected by a spacecraft crossing a planetary bow shock to understand the distribution of energetic particles within the shock*

PEER-REVIEWED JOURNAL PUBLICATIONS

[Google Scholar](#): Citations 343, h-index 11, i10-index 11

32. **Yanqing Su**, M. Arul Kumar, Irene J. Beyerlein, *On the characterization of critical length scales for the growth of twin embryos in pure Mg*, Int. J. Plast. (in prep)
31. Shuozhi Xu, **Yanqing Su**, Wu-Rong Jian, Irene J. Beyerlein, *Molecular statics calculations of the local slip resistance in equal-molar MoNbTi multi-principal element alloys*, Materialia (under review)
30. Lauren T.W. Smith, **Yanqing Su**, Shuozhi Xu, Abigail Hunter, Irene J. Beyerlein, *The effect of local chemical ordering on Frank-Read source activation in a refractory multi-principal element alloy*, Int. J. Plast. (under review)
29. Wu-Rong Jian, Zhuocheng Xie, Shuozhi Xu, **Yanqing Su**, Xiaohu Yao, Irene J. Beyerlein, *Effects of lattice distortion and chemical short-range order on the mechanisms of*

deformation in medium entropy alloy CoCrNi, Acta Mater. (under review)

28. Lu-Lu Li, **Yanqing Su**, Irene J. Beyerlein, Wei-Zhong Han, *Room temperature brittle-to-ductile transition in Fe-Al alloys*, Sci. Adv. (revision submitted)
27. Fulin Wang, Glenn H. Balbus, **Shuozhi Xu**, Yanqing Su, Jungho Shin, Paul F. Rottmann, Keith E. Knippling, Jean-Charles Stinville, Leah H. Mills, Oleg N. Senkov, Irene J. Beyerlein, Tresa M. Pollock, Daniel S. Gianola, *Multiplicity of dislocation pathways in a refractory multi-principal element alloy*, Science (revision submitted)
26. Shuozhi Xu, Emily Hwang, Wu-Rong Jian, **Yanqing Su**, Irene J. Beyerlein, *Atomistic calculations of the generalized stacking fault energies in two refractory multi-principal element alloys*, [Intermetallics](#) 124 (2020) 106844
25. Shuozhi Xu, **Yanqing Su**, Lauren T.W. Smith, Irene J. Beyerlein, *Frank-Read source operation in six body-centered cubic refractory metals*, [J. Mech. Phys. Solids](#) 141 (2020) 104017
24. Anil Kumar, Bouzid Kedjar, **Yanqing Su**, Ludovic Thilly, Irene J. Beyerlein, *Atomic-level calculations and experimental study of dislocations in InSb*, [J. Appl. Phys.](#) 127 (2020) 135104
23. **Yanqing Su**, Milan Ardeljan, Marko Knezevic, Manish Jain, Siddhartha Pathak, Irene J. Beyerlein, *Elastic constants of pure body-centered cubic Mg in nanolaminates*, [Comput. Mater. Sci.](#) 174 (2020) 109501
22. Shuozhi Xu, **Yanqing Su**, Irene J. Beyerlein, *Modeling dislocations with arbitrary character angle in face-centered cubic transition metals using the phase-field dislocation dynamics method with full anisotropic elasticity*, [Mech. Mater.](#) 139 (2019) 103200
21. **Yanqing Su**, Shuozhi Xu, Irene J. Beyerlein, *Density functional theory calculations of generalized stacking fault energy surfaces for eight face-centered cubic transition metals*, [J. Appl. Phys.](#) 126 (2019) 105112 [[Cover](#)] [[Featured](#)]
20. **Yanqing Su**, Shuozhi Xu, Irene J. Beyerlein, *Ab initio-informed phase-field modeling of static dislocation core structures in equal-molar CoNiRu multi-principal element alloys*, [Modelling Simul. Mater. Sci. Eng.](#) 27 (2019) 084001
19. Shuozhi Xu, Marat I. Latypov, **Yanqing Su**, *Concurrent atomistic-continuum simulations of uniaxial compression of gold nano/submicropillars*, [Philos. Mag. Lett.](#) 98 (2018) 173–182
18. Shuozhi Xu, **Yanqing Su**, *Dislocation nucleation from symmetric tilt grain boundaries in body-centered cubic vanadium*, [Phys. Lett. A](#) 382 (2018) 1185–1189
17. Shuozhi Xu, Saeed Zare Chavoshi, **Yanqing Su**, *Deformation mechanisms in nanotwinned tungsten nanopillars: Effects of coherent twin boundary spacing*, [Phys. Status Solidi RRL](#) 12 (2018) 1700399
16. Shuozhi Xu, **Yanqing Su**, Saeed Zare Chavoshi, *Deformation of periodic nanovoid structures in Mg single crystals*, [Mater. Res. Express](#) 5 (2018) 016523
15. Shuozhi Xu, **Yanqing Su**, Dengke Chen, Longlei Li, *An atomistic study of the deformation behavior of tungsten nanowires*, [Appl. Phys. A](#) 123 (2017) 788

14. **Yanqing Su**, Christian Huber, *The effect of nonlinear decompression history on H_2O/CO_2 vesiculation in rhyolitic magmas*, [*J. Geophys. Res.: Solid Earth* 122 \(2017\) 2712–2723](#)
13. Shuozhi Xu, **Yanqing Su**, Dengke Chen, Longlei Li, *Plastic deformation of Cu single crystals containing an elliptic cylindrical void*, [*Mater. Lett.* 193 \(2017\) 283–287](#)
12. Shuozhi Xu, **Yanqing Su**, *Nanovoid growth in BCC α -Fe: Influences of initial void geometry*, [*Modelling Simul. Mater. Sci. Eng.* 24 \(2016\) 085015](#)
11. **Yanqing Su**, Shuozhi Xu, *On the role of initial void geometry in plastic deformation of metallic thin films: A molecular dynamics study*, [*Mater. Sci. Eng.: A* 678 \(2016\) 153–164](#)
10. **Y. Su**, C. Huber, O. Bachmann, Z. Zajacz, H. Wright, J. Vazquez, *The role of crystallization-driven exsolution on the sulfur mass balance in volcanic arc magmas*, [*J. Geophys. Res.: Solid Earth* 121 \(2016\) 5624–5640](#)
9. A. Parmigiani, S. Faroughi, C. Huber, O. Bachmann, **Y. Su**, *Bubble accumulation and its role in the evolution of magma reservoirs in the upper crust*, [*Nature* 532 \(2016\) 492–495](#)
8. C. Huber, **Y. Su**, *A pore-scale investigation of the dynamic response of saturated porous media to transient stresses*, [*Geofluids* 15 \(2014\) 11–23](#)
7. C. Huber, **Y. Su**, C. Nguyen, A. Parmigiani, H. Gonnermann, J. Dufek, *A new bubble dynamics model to study bubble growth, deformation, and coalescence*, [*J. Geophys. Res.: Solid Earth* 119 \(2014\) 216–239](#)
6. LiCan Shan, QuanMing Lu, TieLong Zhang, XinLiang Gao, Can Huang, **YanQing Su**, Shui Wang, *Comparison between magnetic coplanarity and MVA methods in determining the normal of Venusian bow shock*, [*Chin. Sci. Bull.* 58 \(2013\) 2469–2472](#)
5. **Yanqing Su**, Quanming Lu, Xinliang Gao, Can Huang, Shui Wang, *Ion dynamics at supercritical quasi-parallel shocks: Hybrid simulations*, [*Phys. Plasmas* 19 \(2012\) 092108](#)
4. **Yanqing Su**, Quanming Lu, Can Huang, Mingyu Wu, Xinliang Gao, Shui Wang, *Particle acceleration and generation of diffuse superthermal ions at a quasi-parallel collisionless shock: Hybrid simulations*, [*J. Geophys. Res.: Space Phys.* 117 \(2012\) A08107](#)
3. **Su Yan-Qing**, Lu Quan-Ming, *Cross-shock electrostatic potential and ion reflection in quasi-parallel supercritical collisionless shocks*, [*Chin. Phys. Lett.* 29 \(2012\) 089601](#)
2. S.Z. Xu, Z.M. Hao, **Y.Q. Su**, W.J. Hu, Y. Yu, and Q. Wan, *Atomic collision cascades on void evolution in vanadium*, [*Radiat. Eff. Def. Solids* 167 \(2012\) 12–25](#)
1. S.Z. Xu, Z.M. Hao, **Y.Q. Su**, Y. Yu, Q. Wan, and W.J. Hu, *An analysis on nanovoid growth in body-centered cubic single crystalline vanadium*, [*Comput. Mater. Sci.* 50 \(2011\) 2411–2421](#)

TEACHING EXPERIENCE

4. *EAS 2600 Earth Processes*, Teaching Assistant, Georgia Institute of Technology, Atlanta, GA, Fall 2016
3. *EAS 2600 Earth Processes*, Teaching Assistant, Georgia Institute of Technology, Atlanta, GA, Fall 2014

2. *EAS 4610/6130 Earth System Modelling*, Teaching Assistant, Georgia Institute of Technology, Atlanta, GA, Spring 2014
1. *EAS 2600 Earth Processes*, Teaching Assistant, Georgia Institute of Technology, Atlanta, GA, Spring 2013

STUDENT MENTORING

Emily Hwang, undergraduate, Harvey Mudd College *Summer 2019*
 Future Leaders in Advanced Materials Program, UC Santa Barbara
 Project: *Atomistic simulations of dislocations in NbTiZr multi-principal element alloys*

CONFERENCE PRESENTATIONS

9. **Yanqing Su**, Irene J. Beyerlein, *Density functional theory calculations of generalized stacking fault energies in equal-molar MoNbTi multi-principal element alloys*, TMS Annual Meeting, San Diego, CA, Feb 27, 2020 [**Invited**]
8. **Yanqing Su**, M. Kumar, Xin Wang, Yang Hu, Kehang Yu, Jiayang Wang, Subhash Mahajan, Enrique Lavernia, Tim Rupert, Julie Schoenung, Irene J. Beyerlein, *Characterization of twin-twin interactions in Mg*, TMS Annual Meeting, San Diego, CA, Feb 27, 2020 [**Invited**]
7. **Yanqing Su**, Emily Hwang, Jun Xu, Shuozhi Xu, Irene J. Beyerlein, *Atomistic calculations of the Peierls stress in NbTiZr multi-principal element alloys*, Poster, World Congress on High Entropy Alloys, Seattle, WA, Nov 18, 2019
6. **Yanqing Su**, Shuozhi Xu, *On the role of initial void geometry in plastic deformation of metallic thin films*, Poster, Georgia Tech Career, Research, Innovation and Development Conference, Atlanta, GA, Mar 5, 2016
5. **Y. Su**, C. Huber, *H₂O-CO₂ degassing in rhyolitic eruptions and implication of magma ascent history*, Poster, Geological Society of America Annual Meeting, Baltimore, MD, Nov 1–4, 2015
4. **Y. Su**, C. Huber, O. Bachmann, Z. Zajacz, H. Wright, J. Vazquez, *Magma boiling underneath volcanoes*, Poster, Georgia Tech Career, Research, Innovation and Development Conference, Atlanta, GA, Mar 5, 2015
3. **Y. Su**, C. Huber, O. Bachmann, Z. Zajacz, H. Wright, J. Vazquez, *Magma boiling underneath volcanoes: A key to massive S release during eruption*, Poster, American Geophysical Union Fall Meeting, San Francisco, CA, Dec 15–19, 2014
2. Olivier Bachmann, **Yanqing Su**, Christian Huber, Zoltán Zajacz, *Numerical study of sulfur outgassing in response to decompression and crystallization*, Poster, American Geophysical Union Fall Meeting, San Francisco, CA, Dec 9–13, 2013
1. **Yanqing Su**, Christian Huber, *Bubble suspension dynamics under shear flow: a numerical approach*, American Geophysical Union Fall Meeting, San Francisco, CA, Dec 9–13, 2013

SEMINARS AND WORKSHOPS

8. **Yanqing Su**, Irene J. Beyerlein, *Defining critical length scales for the growth of twin embryos in pure Mg*, Poster, Winter Study Group on High Performance Materials, Santa Barbara, CA, Jan 14, 2020
7. **Yanqing Su**, *Predictive multiscale exploration of advanced metallic materials*, Department of Mechanical and Aerospace Engineering, Utah State University, Logan, UT, Dec 19, 2019
6. **Yanqing Su**, *Volatiles: a good indicator of how volcanoes erupt*, Los Alamos National Laboratory, Los Alamos, NM, Jan 05, 2017
5. **Yanqing Su**, *H₂O-CO₂ degassing in rhyolitic eruptions and implication of magma ascent history*, Georgia Tech Geophysics Seminar, Atlanta, GA, Nov 06, 2015
4. **Yanqing Su**, *Numerical study of volatile diffusion in volcanic system*, University of Science and Technology of China, Hefei, China, May 10, 2015
3. **Yanqing Su**, *Implications from volcanic sulfur degassing: Cerro Galan eruption (2.08 Ga)*, Georgia Tech Geophysics Seminar, Atlanta, GA, Apr 24, 2015
2. **Yanqing Su**, *Source of “extra” sulfur from volcanic eruptions*, Georgia Tech Geophysics Seminar, Atlanta, GA, Apr 04, 2014
1. **Yanqing Su**, *A numerical approach for understanding excess sulfur degassing*, Georgia Tech Geophysics Seminar, Atlanta, GA, Nov 15, 2013

SERVICE TO PROFESSION

- Reviewer for *Mech. Mater.*, *Mater. Res. Express*, *Eur. J. Mech. B/Fluids*, and *Phys. Fluids*
- Treasurer, Georgia Tech SEG Chapter, 2013–2014

FIELD WORK

- Measured background seismic activity and noise level, Panola Mountain State Park, GA, 2016
- Identified size distribution of enclaves, Aztec Wash Pluton, Death Valley National Park, NV, 2013
- Recorded solar eclipses, Qianshan, China, 2012