
Wu-Rong Jian

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Employment

Postdoctoral Scholar

Stanford University,
Stanford, CA, United States
Advisor: Professor Wei Cai

04/2022-present

Education

Ph.D. - Mechanical Engineering

University of California Santa Barbara,
Santa Barbara, CA, United States
Advisor: Professor Irene J. Beyerlein

09/2018-03/2022

M.S. - Mechanics

South China University of Technology, Guangzhou, China
Advisor: Professor Xiaohu Yao

09/2014-06/2018

B.S. - Engineering Mechanics

South China University of Technology, Guangzhou, China

09/2010-07/2014

Honors and Awards

- Regents in Mechanical Engineering Fellowship, University of California, Santa Barbara, United States, 2018
- Outstanding Master Thesis (Guangdong), Guangdong, China, 2018
- Outstanding Graduate Student (Guangdong), Guangdong, China, 2016
- National Scholarship for Graduate Students, China, December 2015
- Scholarship for Excellent Freshmen of Postgraduate, South China University of Technology, China, September 2014

Journal Reviewers (21 Journals)

Acta Materialia, Scripta Materialia, International Journal of Plasticity, Journal of Materials Science & Technology, Computational Materials Science, Modelling and Simulation in Materials Science and Engineering, Journal of Alloys and Compounds, Nanotechnology, Applied Surface Science, Journal of Materials Research, Journal of Physics D: Applied Physics, Journal of Physics: Materials, Journal of Physics: Condensed Matter, Materials Research Express, Micromachines, Materials, Journal of Micromechanics and Microengineering, Nanomaterials, Nuclear Technology, Applied Sciences, Polymers

Presentations

1. "Dislocation Evolution in Copper during Nanoindentation," The 10th International Conference on Multiscale Materials Modeling (Baltimore, USA, 2022)

2. “Deformation mechanisms in the medium entropy alloy CoCrNi: Effects of lattice distortion and chemical short-range order,” MS&T21: Materials Science & Technology (Columbus, USA, 2021)
3. “Confined layer slip in nanolaminates: Effect of interface structure and layer thickness,” MS&T21: Materials Science & Technology (Columbus, USA, 2021)
4. “Mechanical Properties of Cu(111)/ Cu₆₄Zr₃₆ glass nanolaminates,” The 54th Annual Technical Meeting of the Society of Engineering Science (Boston, USA, 2017)
5. “Shock-induced melting of open-cell nanoporous Cu foams: Effects of porosity and specific surface area,” The 26th International Conference on High Pressure Science and Technology (Beijing, China, 2017)

Publications (1-36)

1. Guanyu Huang, Xiaoqing Zhang, Zhuocheng Xie, **Wu-Rong Jian**, Run Zhang and Xiaohu Yao, [Effects of lattice distortion and chemical short-range order on creep behavior of medium-entropy alloy CoCrNi](#), *Mechanics of Materials* 177 (2023) 104549.
2. Ankit Gupta, **Wu-Rong Jian**, Shuozhi Xu, Irene J. Beyerlein and Garritt J. Tucker, [On the deformation behavior of CoCrNi medium entropy alloys: Unraveling mechanistic competition](#), *International Journal of Plasticity* 159 (2022) 103442.
3. Shuozhi Xu, **Wu-Rong Jian** and Irene J. Beyerlein, [Ideal simple shear strengths of two HfNbTaTi-based quinary refractory multi-principal element alloys](#), *APL Materials* 10 (2022) 111107.
4. Zhuocheng Xie, **Wu-Rong Jian**, Shuozhi Xu, Irene J. Beyerlein, Xiaoqing Zhang, Xiaohu Yao and Run Zhang, [Phase transition in medium entropy alloy CoCrNi under quasi-isentropic compression](#), *International Journal of Plasticity* 157 (2022) 103389.
5. **Wu-Rong Jian**, Shuozhi Xu, Yanqing Su and Irene J. Beyerlein, [Energetically favorable dislocation/nanobubble bypass mechanism in irradiation conditions](#), *Acta Materialia* 230 (2022) 117849.
6. **Wu-Rong Jian**, Shuozhi Xu, Yanqing Su and Irene J. Beyerlein, [Effects of layer thickness and dislocation distribution on confined layer slip in nanolaminated Nb](#), *International Journal of Plasticity* 152 (2022) 103239.
7. Rebecca A. Romero, Shuozhi Xu, **Wu-Rong Jian**, Irene J. Beyerlein and C.V. Ramana, [Atomistic simulations of the local slip resistances in four refractory multi-principal element alloys](#), *International Journal of Plasticity* 149 (2022) 103157.
8. **Wu-Rong Jian**, Zhuocheng Xie, Shuozhi Xu, Xiaohu Yao, Irene J. Beyerlein, [Shock-induced amorphization in medium entropy alloy CoCrNi](#), *Scripta Materialia* 209 (2022) 114379.
9. Shuozhi Xu, **Wu-Rong Jian**, Yanqing Su and Irene J. Beyerlein. [Line-length-dependent dislocation glide in refractory multi-principal element alloys](#). *Applied Physics Letters* 120 (2022) 061901.
10. Zhuocheng Xie, **Wu-Rong Jian**, Shuozhi Xu, Irene J. Beyerlein, Xiaoqing Zhang, Zhihua Wang and Xiaohu Yao. [Role of local chemical fluctuations in the shock dynamics of medium entropy alloy CoCrNi](#). *Acta Materialia* 221 (2021) 117380.
11. **Wu-Rong Jian**, Liang Wang, Wenbo Bi, Shuozhi Xu, and Irene J. Beyerlein. [Role of local chemical fluctuations in the melting of medium entropy alloy CoCrNi](#). *Applied Physics Letters* 119 (2021) 121904. (Invited Paper)
12. Ruo-Yao Zheng, **Wu-Rong Jian**, Irene J. Beyerlein, and Wei-Zhong Han. [Atomic-Scale Hidden Point-Defect Complexes Induce Ultrahigh-Irradiation Hardening in Tungsten](#). *Nano Letters* 21 (2021) 5798.

13. **Wu-Rong Jian**, Yanqing Su, Shuozhi Xu, Weisen Ji and Irene J. Beyerlein. [Effect of interface structure on dislocation glide behavior in nanolaminates](#). *Journal of Materials Research* 36 (2021) 2802. (Invited Paper)
14. Xiaowang Wang, Shuozhi Xu, **Wu-Rong Jian**, Xiang-guo Li, Yanqing Su and Irene J. Beyerlein. [Generalized stacking fault energies and Peierls stresses in refractory body-centered cubic metals from machine learning-based interatomic potentials](#). *Computational Materials Science* 192 (2021) 110364.
15. **Wu-Rong Jian**, Shuozhi Xu, and Irene J. Beyerlein. [On the significance of model design in atomistic calculations of the Peierls stress in Nb](#). *Computational Materials Science* 188 (2021) 110150.
16. Shuozhi Xu, Yanqing Su, **Wu-Rong Jian** and Irene J. Beyerlein. [Local slip resistances in equal-molar MoNbTi multi-principal element alloy](#). *Acta Materialia* 202 (2020) 68.
17. **Wu-Rong Jian**, Zhuocheng Xie, Shuozhi Xu, Yanqing Su, Xiaohu Yao and Irene J. Beyerlein. [Effects of lattice distortion and chemical short-range order on the mechanisms of deformation in medium entropy alloy CoCrNi](#). *Acta Materialia* 199 (2020) 352.
18. Zhuocheng Xie, **Wu-Rong Jian**, Xiaochang Tang, Xiaoqing Zhang, and Xiaohu Yao. [Strengthening and toughening mechanisms of metallic glass nanocomposites via graphene nanoplatelets](#). *Journal of Non-Crystalline Solids* 546 (2020) 120284.
19. Shuozhi Xu, Emily Hwang, **Wu-Rong Jian**, Yanqing Su, and Irene J. Beyerlein. [Atomistic calculations of the generalized stacking fault energies in two refractory multi-principal element alloys](#). *Intermetallics* 124 (2020) 106844.
20. Zhuocheng Xie, **Wu-Rong Jian**, Zhihua Wang, Xiaoqing Zhang, and Xiaohu Yao. [Layer thickness effects on the strengthening and toughening mechanisms in metallic glass-graphene nanolaminates](#). *Computational Materials Science* 177 (2020) 109536.
21. **Wu-Rong Jian**, Min Zhang, Shuozhi Xu, and Irene J. Beyerlein. [Atomistic simulations of dynamics of an edge dislocation and its interaction with a void in copper: a comparative study](#). *Modelling and Simulation in Materials Science and Engineering* 28 (2020) 045004.
22. X. J. Long, Y. Cai, **W. R. Jian**, L. Wang, and S. N. Luo. [Acoustic and double elastic shock waves in single-crystal graphene](#). *Journal of Applied Physics* 127 (2020) 055101.
23. Y. H. Mo, L. Y. Meng, X. C. Tang, X. H. Yao, J. W. Qiao, and **W. R. Jian**. [The toughening mechanism and spatial-temporal evolution of shear bands at different strain rates in Vit-1 metallic glass](#). *Materials Science and Engineering: A* 773 (2020) 138855.
24. **Wu-Rong Jian**, Xiaohu Yao, Yugang Sun, Zhuocheng Xie, and Xiaoqing Zhang. [Size-dependent vibration analysis of carbon nanotubes](#). *Journal of Materials Research* 34 (2019) 2148. (Invited Paper)
25. J. M. Zhan, **W. R. Jian**, X. C. Tang, Y. L. Han, W. H. Li, X. H. Yao, and L. Y. Meng. [Tensile deformation of nanocrystalline Al-matrix composites: Effects of the SiC particle and graphene](#). *Computational Materials Science* 156 (2019) 187.
26. **W. R. Jian**, L. Wang, X. H. Yao, and S. N. Luo. [Tensile and nanoindentation deformation of amorphous/crystalline nanolaminates: Effects of layer thickness and interface type](#). *Computational Materials Science* 154 (2018) 225.
27. X. C. Tang, L. Y. Meng, J. M. Zhan, **W. R. Jian**, W. H. Li, X. H. Yao, and Y. L. Han. [Strengthening effects of encapsulating graphene in SiC particle-reinforced Al-matrix composites](#). *Computational Materials Science* 153 (2018) 275.

28. **W. R. Jian**, X. J. Long, M. X. Tang, Y. Cai, X. H. Yao, and S. N. Luo. [Deformation and spallation of shock-loaded graphene: Effects of orientation and grain boundary](#). *Carbon* 132 (2018) 520.
29. X. C. Tang, **W. R. Jian**, J. Y. Huang, F. Zhao, C. Li, X. H. Xiao, X. H. Yao, and S. N. Luo. [Spall damage of a Ta particle-reinforced metallic glass matrix composite under high strain rate loading](#). *Materials Science and Engineering: A* 711 (2018) 284.
30. **W. R. Jian**, L. Wang, X. H. Yao, and S. N. Luo. [Balancing strength, hardness and ductility of Cu₆₄Zr₃₆ nanoglasses via embedded nanocrystals](#). *Nanotechnology* 29 (2017) 025701.
31. **W. R. Jian**, L. Wang, B. Li, X. H. Yao, and S. N. Luo. [Improved ductility of Cu₆₄Zr₃₆ metallic glass/Cu nanocomposites via phase and grain boundaries](#). *Nanotechnology* 27 (2016) 175701.
32. Bo Li, Liang Wang, **Wu-Rong Jian**, E. Jun-Cheng, Hong-Hao Ma, and Sheng-Nian Luo. [Irradiation-initiated plastic deformation in prestrained single-crystal copper](#). *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms* 368 (2016) 60.
33. **W. R. Jian**, B. Li, L. Wang, X. H. Yao, and S. N. Luo. [Shock response of open-cell nanoporous Cu foams: Effects of porosity and specific surface area](#). *Journal of Applied Physics* 118 (2015) 165902.
34. F. P. Zhao, B. Li, **W. R. Jian**, L. Wang, and S. N. Luo. [Shock-induced melting of honeycomb-shaped Cu nanofoams: Effects of porosity](#). *Journal of Applied Physics* 118 (2015) 035904.
35. **W. R. Jian**, X. H. Yao, L. Wang, X. C. Tang, and S. N. Luo. [Short-and medium-range orders in Cu₄₆Zr₅₄ metallic glasses under shock compression](#). *Journal of Applied Physics* 118 (2015) 015901.
36. W. H. Lee, X. H. Yao, **W. R. Jian**, and Q. Han. [High-velocity shock compression of SiC via molecular dynamics simulation](#). *Computational Materials Science* 98 (2015) 297.