

# MINGWEI ZHANG

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Department of Materials Science and Engineering ◊ University of California, Davis  
One Shields Ave., Davis, CA 95616, USA

## RESEARCH INTERESTS

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**Metallic structural materials under extreme conditions, transmission electron microscopy, advanced materials manufacturing and processing, mechanical properties, deformation mechanisms**

## EDUCATION

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**University of California, Davis**

*September 2017 - August 2021*

**Ph.D.** in Materials Science and Engineering

Dissertation: Creep Properties and Dislocation Kinetics of Dispersion-Strengthened Alloys and Multi-Principal Element Alloys

**Shanghai Jiao Tong University**

*September 2013 - June 2017*

**B.E.** in Materials Science and Engineering

## PROFESSIONAL EXPERIENCE

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**Assistant professor (07/2023 - present)**

University of California, Davis, CA, USA

**Postdoctoral Researcher (10/2021 - 07/2023)**

Lawrence Berkeley National Laboratory, Berkeley, CA, USA

**Graduate Student Researcher (09/2017 - 08/2021)**

University of California, Davis, CA, USA

**Undergraduate Student Researcher (06/2015 - 06/2017)**

Shanghai Jiao Tong University, Shanghai, China

## TEACHING EXPERIENCE

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**Lead Teaching Assistant (UC Davis)**

**2020 Fall Quarter**

**Materials in engineering design (EMS180):** an undergraduate course on quantitative treatment of materials selection for engineering applications. Discussion of design and material selection strategy; process & process selection strategy; process economics; life-cycle thinking and eco-design. Use of materials selection software.

**2019 Fall Quarter**

**Thermodynamics of Materials (EMS160):** an undergraduate course on thermodynamic principles of interest to materials scientists and engineers and their application to material processing, phase stability and corrosion.

### **2019 Spring Quarter**

**Mechanical Behavior Lab (EMS174L):** an undergraduate course on experimental investigation of mechanical behavior of engineering materials. Laboratory exercises emphasize the fundamental relationship between microstructure and mechanical properties and the evolution of the microstructure as a consequence of rate processes.

### **2019 Winter Quarter**

**Kinetics of Materials (EMS164):** an undergraduate course on basic kinetic laws and principles governing phase transformations and their applications to diffusion, oxidation, nucleation, growth and spinodal transformations.

## **AWARDS**

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### **Best Oral Presentation Award of Symposium SF01, 2023**

2023 MRS Spring Meeting

### **Summer Graduate Student Researcher Award, 2021**

University of California, Davis

### **Alfred H. and Marie E. Gibeling Fellowship, 2021**

University of California, Davis

### **UCD Graduate Research Award, 2021**

University of California, Davis

### **Erhardt-Takamura Fellowship, 2021**

University of California, Davis

### **Materials Science and Engineering Departmental Fellowship, 2017**

University of California, Davis

### **Academic Excellence Scholarship, 2016**

Shanghai Jiao Tong University

## PRESENTATIONS

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1. **M. Zhang**, F. Walsh, R.O. Ritchie, M. Asta, A.M. Minor "Diffuse electron diffraction intensities in concentrated solid solutions do not necessarily come from short-range order" invited talk at the Microscopy and Microanalysis Meeting (2023), Minneapolis, MN, USA.
2. **M. Zhang**, F. Walsh, M. Payne, P. Kumar, R.O. Ritchie, M. Asta, A.M. Minor "Investigating the origin of diffuse scattering and extra reflections in electron microscopy studies of FCC high/medium entropy alloys" at the Materials Research Society 2023 Spring Meeting and Exhibit, San Francisco, CA, USA.
3. **M. Zhang**, F. Walsh, M. Payne, P. Kumar, R.O. Ritchie, M. Asta, A.M. Minor "Mechanical determination of peak short-range ordering in CrCoNi via nanoindentation" invited talk at the TMS annual meeting (2023), San Diego, CA, USA.
4. **M. Zhang** "Characterizing Short-Range Order in the CrCoNi Multiple Principal Element Alloy Using Energy-Filtered Electron Diffraction, HRS/TEM, and 4DSTEM Techniques" invited talk at the EFRC biweekly seminar (2022).
5. **M. Zhang**, Q. Yu, D. Liu, R.O. Ritchie, A.M. Minor "Probing Short-Range Order and its Effect on the Mechanical Properties of a CrCoNi Multi-Principal Element Alloy Using Nanoindentation" at the Materials Science and Technology technical meeting and exhibition (2022), Pittsburg, PA, USA.
6. **M. Zhang**, E.P. George, J.C. Gibeling, "Elevated-Temperature Deformation Mechanisms in a CrMnFeCoNi High Entropy Alloy" at the 2nd World Congress on High Entropy Alloys (2021) Charlotte, NC, USA.
7. **M. Zhang**, J.C. Gibeling, "Understanding Creep Mechanisms and Modeling Creep Deformation in Dispersion-Strengthened Alloys" at 15th International Conference on Creep and Fracture of Engineering Materials and Structures (2021).
8. **M. Zhang**, E.P. George, J.C. Gibeling, "High-temperature tensile creep properties of a CrMnFeCoNi high entropy alloy" at Materials Research Society 2020 Fall Virtual Meeting and Exhibit.
9. S. Gentry, **M. Zhang**, N. Shuman, R. Altovar, "Investigating the effects of interfacial and strain energies on precipitate morphology using PRISMS-PF" at Summer 2020 Webinar Series: Utilizing nanoHUB Tools for Materials Science Education.
10. S. Gentry, S. Dewitt, **M. Zhang**, "Student inquiry of precipitate morphologies using an online GUI for PRISMS-PF" at Materials Research Society 2019 Fall Meeting and Exhibit, Boston, MA, USA.

## PUBLICATIONS

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1. F. Walsh, **M. Zhang**, R.O. Ritchie, A.M. Minor, M.D. Asta, Extra electron reflections in concentrated alloys do not necessitate short-range order, *Nature Materials*, in press (2023).
2. G. Sahragard-Monfared, **M. Zhang**, T.M. Smith, A.M. Minor, J.C. Gibeling, Superior tensile creep behavior of a novel oxide dispersion strengthened CrCoNi multi-principal element alloy, *Acta Materialia*, 255 (2023) 119032.  
<https://doi.org/10.1016/j.actamat.2023.119032>
3. P. Kumar, S. Kim, Q. Yu, J. Ell, **M. Zhang**, Y. Yang, J. Kim, H. Park, A.M. Minor, E. Park, R.O. Ritchie, Compressive vs. tensile yield and fracture toughness behavior of a body-centered cubic refractory high-entropy superalloy Al<sub>0.5</sub>Nb<sub>1.25</sub>Ta<sub>1.25</sub>TiZr at temperatures from ambient to 1200C, *Acta Materialia* 245 (2023) 118620.  
<https://doi.org/10.1016/j.actamat.2022.118620>

4. **M. Zhang**, Q. Yu, C. Frey, F. Walsh, M.I. Payne, P. Kumar, D. Liu, T.M. Pollock, M.D. Asta, R.O. Ritchie, A.M. Minor, Determination of peak ordering in the CrCoNi medium-entropy alloy via nanoindentation, *Acta Materialia* 241 (2022) 118380. <https://doi.org/10.1016/j.actamat.2022.118380>
5. **M. Zhang**, E.P. George, J.C. Gibeling, Elevated-temperature deformation mechanisms in a CrMnFeCoNi high-entropy alloy, *Acta Materialia* 218 (2021) 117181. <https://doi.org/10.1016/j.actamat.2021.117181>
6. **M. Zhang**, R.J. Lewis, J.C. Gibeling, Mechanisms of Creep Deformation in a Rapidly Solidified Al-Fe-V-Si Alloy, *Materials Science and Engineering A* (2021) 140796. <https://doi.org/10.1016/j.msea.2021.140796>
7. **M. Zhang**, E.P. George, J.C. Gibeling, Tensile creep properties of a CrMnFeCoNi high-entropy alloy, *Scripta Materialia* 194 (2021) 113633. <https://doi.org/10.1016/j.scriptamat.2020.113633>
8. **M. Zhang**, J.C. Gibeling, Understanding creep mechanisms of a Cu-Cr-Nb alloy by testing under constant structure conditions, *Scripta Materialia* 190 (2021) 131-135. <https://doi.org/10.1016/j.scriptamat.2020.08.036>
9. **M. Zhang**, S.E. Broyles, J.C. Gibeling, An improved description of creep in dispersion-strengthened metals, *Acta Materialia* 196 (2020) 384-395. <https://doi.org/10.1016/j.actamat.2020.06.036>
10. S.E. Broyles, **M. Zhang**, J.C. Gibeling, Influence of annealing on the creep behavior of GlidCop Al-15, *Materials Science and Engineering A* 779 (2020) 139112. <https://doi.org/10.1016/j.msea.2020.139112>
11. C. Li, **M. Zhang**, M. Ruan, J. Wang, J. Liang, D. Zhang, A nanograins-attached and ultrathin Cu flake powder fabricated by high energy mechanical milling and dealloying, *Materials Letters* 265 (2020) 127432. <https://doi.org/10.1016/j.matlet.2020.127432>
12. C. Li, Y. Xie, **M. Zhang**, M. Ruan, J. Wang, J. Liang, R. Logé D. Zhang, Enhanced strength and toughness of bulk ultrafine grained Cu by nacre-inspired lamellar structure, *Journal of Alloys and Compounds* 826 (2020) 154234. <https://doi.org/10.1016/j.jallcom.2020.154234>
13. L.G. Vettrano, **M. Zhang**, J.L.W. Carter, J.R. Groza, J.C. Gibeling, A phenomenological understanding of the influence of processing methods on creep of Cu-8Cr-4Nb (GRCop-84), *Materials Science and Engineering A* 756 (2019) 538-544. <https://doi.org/10.1016/j.msea.2019.04.074>

## PROPOSALS

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1. **M. Zhang**, M.I. Payne, A.M. Minor, Direct investigation of the effect of short-range order on the mechanical properties and deformation mechanisms of FCC and BCC multi-principal element alloys (2022), National Center for Electron Microscopy, Molecular Foundry, Lawrence Berkeley National Laboratory.
2. M.I. Payne, **M. Zhang**, A.M. Minor, High temperature tensile testing of refractory high entropy alloys (2022), National Center for Electron Microscopy, Molecular Foundry, Lawrence Berkeley National Laboratory.
3. R.O. Ritchie, A.M. Minor, M.D. Asta, P. Kumar, **M. Zhang**, F. Walsh, M.I. Payne, Damage tolerance in structural materials (renewed 2022), Basic Energy Sciences, Department of Energy.
4. **M. Zhang**, R. Zhang, A.M. Minor, In-situ investigation of mechanical properties, microstructure evolution, and deformation mechanisms in heavy ion-irradiated CrCoNi and CrMnFeCoNi multi-principal element alloys (2021), National Center for Electron Microscopy, Molecular Foundry, Lawrence Berkeley National Laboratory.
5. **M. Zhang**, R. Zhang, A.M. Minor, In-situ investigation of mechanical properties, microstructure evolution, and deformation mechanisms in heavy ion-irradiated CrCoNi and CrMnFeCoNi multi-

principal element alloys (2021), Center for Integrated Nanotechnologies, Los Alamos National Laboratory.