

# Curriculum Vitae

Wen Chen, Ph.D.

Department of Aerospace and Mechanical Engineering  
Department of Chemical Engineering & Materials Science (Joint Appointment)  
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## DESCRIPTION

Dr. Wen Chen's research focuses on materials processing, metallurgy, architected materials, and mechanical behavior of materials. Dr. Chen directs the Multi-scale Materials and Manufacturing Laboratory at the University of Southern California. Before this appointment, he was an Associate Professor at the University of Massachusetts Amherst. He obtained his Ph.D. in Mechanical Engineering and Materials Science at Yale University.

## EDUCATION

|        |  |  |      |
|--------|--|--|------|
| Ph.D.  | Mechanical Engineering & Materials Science | Yale University                              | 2016 |
| M.Phil | Industrial and Systems Engineering         | The Hong Kong Polytechnic University         | 2011 |
| B.S.   | Materials Science and Engineering          | Nanjing University of Science and Technology | 2008 |

## WORK EXPERIENCE

|                   |   |
|-------------------|---|
| 01/2025 – Present | <b>Associate Professor</b> , Department of Aerospace and Mechanical Engineering, Department of Chemical Engineering & Materials Science (Joint Appointment), University of Southern California, USA |
| 06/2024 – 12/2024 | <b>Associate Professor</b> , Department of Mechanical and Industrial Engineering, University of Massachusetts Amherst, USA  |
| 09/2018 – 05/2024 | <b>Assistant Professor</b> , Department of Mechanical and Industrial Engineering, University of Massachusetts Amherst, USA  |
| 12/2015 – 08/2018 | <b>Postdoctoral Research Scientist</b> , Materials Engineering Division, Lawrence Livermore National Laboratory, USA  |

## HONORS AND AWARDS

|      |   |
|------|---|
| 2024 | Barbara H. and Joseph J. Goldstein Outstanding Junior Faculty Award   |
| 2023 | 35 Emerging Young Investigators Under 35(ish) highlighted by journal <i>Matter</i>  |
| 2023 | NSF CAREER Award  |
| 2016 | Best Poster Award, 11 <sup>th</sup> International Bulk Metallic Glass Conference, Washington University at St. Louis., USA. |
| 2016 | Acta Student Award, Acta Materialia   |
| 2015 | Pierre W. Hoge Fellowship, Yale University  |
| 2015 | Outstanding Reviewer, Materials Science and Engineering: A  |

## PEER REVIEWED PUBLICATIONS

- [1] Y. Han, H. Chen, Y. Sun, J. Liu, S. Wei, B. Xie, Z. Zhang, Y. Zhu, M. Li, J. Yang, W. Chen, P. Cao, Y. Yang, Ubiquitous short-range order in multi-principal element alloys, *Nature Communications*, 15 (2024) 6486.
- [2] S. Mooraj, X. Dong, S. Zhang, Y. Zhang, J. Ren, S. Guan, C. Li, R. Naorem, N. Argibay, W. Chen, W. Yan, D. Raabe, Z. Sun, W. Chen, Crack mitigation in additively manufactured AlCrFe<sub>2</sub>Ni<sub>2</sub> high-entropy alloys through engineering phase transformation pathway, *Communications Materials*, 5 (2024) 101.

- [3] S. Son, J. Lee, P. Asghari-Rad, R.E. Kim, H. Park, J. Jang, W. Chen, Y. Heo, H.S. Kim, Hierarchically heterogeneous microstructure and mechanical behavior of the multi-materials prepared by powder severe plastic deformation, *Materials Research Letters*, 11 (2023) 915.
- [4] S. Mooraj, G. Kim, X. Fan, S. Samuha, Y. Xie, T. Li, J.S. Tiley, Y. Chen, D. Yu, K. An, P. Hosemann, P.K. Liaw, Wei Chen, Wen Chen, Additive manufacturing of defect-free TiZrNbTa refractory high-entropy alloy with enhanced elastic isotropy via in-situ alloying of elemental powders, *Communications Materials*, 5 (2024) 14.
- [5] T. Keller, W. Yang, W. Chen, I. Baker, Additive manufacturing of Mn-Al permanent magnets via laser powder bed fusion, *Materialia*, 33 (2024) 101978.
- [6] A.D. Pope, S. Iwan, M.P. Clay, J. Ren, W. Yang, W. Chen, Y.K. Vohra, Phase stability of a eutectic high entropy alloy under extremes of pressures and temperatures, *AIP Advances*, 14 (2024) 025239.
- [7] E. Tekoğlu, A.D. O'Brien, J. Bae, K. Lim, J. Liu, S. Kavak, Y. Zhang, S.Y. Kim, D. Ağaogulları, W. Chen, A.J. Hart, G. Sim, Ju Li, Metal matrix composite with superior ductility at 800° C: 3D printed In718+ ZrB2 by laser powder bed fusion, *Composites Part B: Engineering*, 268 (2024) 111052.
- [8] J. Ren, M. Wu, C. Li, S. Guan, J. Dong, J. Forien, T. Li, K.S. Shanks, D. Yu, Y. Chen, K. An, K.Y. Xie, W. Chen, T. Voisin, W. Chen, Deformation mechanisms in an additively manufactured dual-phase eutectic high-entropy alloy, *Acta Materialia*, 257 (2023) 119179.
- [9] S. Son, J. Lee, P. Asghari-Rad, R.E. Kim, H. Park, J. Jang, W. Chen, Y. Heo, H.S. Kim, Hierarchically heterogeneous microstructure and mechanical behavior of the multi-materials prepared by powder severe plastic deformation, *Materials Research Letters*, 11 (2023) 915-924.
- [10] J. Fu, S. Mooraj, A. Ng, C. Zhu, W. Chen, E. Detsi, Sub-100 mA/cm<sup>2</sup> CO<sub>2</sub>-to-CO Reduction Current Densities in Hierarchical Porous Gold Electrocatalysts Made by Direct Ink Writing and Dealloying, *ACS Applied Materials & Interfaces*, 15 (2023) 27905.
- [11] S. Mooraj, W. Chen, A Review on High-Throughput Development of High-Entropy Alloys by Combinatorial Methods, *Journal of Materials Informatics*, 3 (2023) 4.
- [12] S. Zhang, P. Hou, J. Kang, T. Li, S. Mooraj, Y. Ren, A.J. Hart, S. Gerasimidis, W. Chen, Laser additive manufacturing for infrastructure repair: A case study of a deteriorated steel bridge beam, *Journal of Materials Science and Technology*, 154 (2023) 149.
- [13] A.D. Pope, S. Iwan, M.P. Clay, Y.K. Vohra, K. Katagiri, L. Dresselhaus-Marais, J. Ren, W. Chen, Nanolamellar phase transition in an additively manufactured eutectic high-entropy alloy under high pressures, *AIP Advances*, 13 (2023) 035124.
- [14] E. Tekoglu, A.D. O'Brien, J. Liu, B. Wang, S. Kavak, Y. Zhang, S.Y. Kim, S. Wang, D. Agaogullari, W. Chen, A.J. Hart, J. Li, Strengthening Inconel 718 through in situ formation of carbide and silicide nanoprecipitates by laser powder bed fusion, *Additive Manufacturing*, 67 (2023) 103478.
- [15] S. Mooraj, J. Dong, K.Y. Xie, W. Chen, Formation of printing defects and their effects on mechanical properties of additively manufactured metal alloys, *Journal of Applied Physics*, 132 (2022) 225108.
- [16] J. Ren, Y. Zhang, D. Zhao, Y. Chen, S. Guan, Y. Liu, L. Liu, S. Peng, F. Kong, J. Poplawsky, G. Gao, T. Voisin, K. An, Y.M. Wang, K.Y. Xie, T. Zhu, W. Chen, Strong yet ductile nanolamellar high-entropy alloys by additive manufacturing, *Nature*, 608 (2022) 62-68.
- [17] S. Son, P. Asghari-Rad, A. Zargaran, W. Chen, H.S. Kim, Superlative room temperature and cryogenic tensile properties of nanostructured CoCrFeNi medium-entropy alloy fabricated by powder high-pressure torsion, *Scripta Materialia* 213 (2022) 114631.
- [18] Y. Zhang, K. Ding, Y. Gu, W. Chen, Y.M. Wang, J. El-Awady, D.L. McDowell, T. Zhu, Modeling of microscale internal stresses in additively manufactured stainless steel, *Modelling and Simulation in Materials Science and Engineering*, 30 (2022) 074001.
- [19] S. Zhang, P. Hou, S. Mooraj, W. Chen, Printability of Zr<sub>41.2</sub>Ti<sub>13.8</sub>Cu<sub>12.5</sub>Ni<sub>10.0</sub>Be<sub>22.5</sub> metallic glass on steel by laser additive manufacturing: A single-track study, *Surface and Coatings Technology*, 428 (2021) 127882.
- [20] S. Guan, J. Ren, S. Mooraj, Y. Liu, S. Feng, S. Zhang, J. Liu, X. Fan, P.K. Liaw, W. Chen, Additive Manufacturing of High-Entropy Alloys: Microstructural Metastability and Mechanical Behavior, *Journal*

*of Phase Equilibria and Diffusion*, 35 (2021) 1-24.

- [21] S. Jeon, X. Liu, C. Azersky, J. Ren, S. Zhang, W. Chen, R.W. Hyers, K. Costa, M. Kolbe, D.M. Matson, Particle size effects on dislocation density, microstructure, and phase transformation for high-entropy alloy powders, *Materialia*, 2021, 101161
- [22] J. Shittu, M. Sadeghilaridjani, M. Pole, S. Muskeri, J. Ren, Y. Liu, I. Tahoun, H. Arora, W. Chen, N. Dahotre, S. Mukherjee, Tribo-corrosion response of additively manufactured high-entropy alloy, *npj Materials Degradation* 5 (2021): 1.
- [23] S. Mooraj, Z. Qi, C. Zhu, J. Ren, S. Peng, L. Liu, S. Zhang, S. Feng, F. Kong, Y. Liu, E.B. Duoss, S. Baker, W. Chen, 3D printing of metal-based materials for renewable energy applications, *Nano Research*, 14 (2021) 2105.
- [24] S. Peng, S. Mooraj, R. Feng, L. Liu, J. Ren, Y. Liu, F. Kong, Z. Xiao, C. Zhu, P.K. Liaw, W. Chen, Additive manufacturing of three-dimensional (3D)-architected CoCrFeNiMn high-entropy alloy with great energy absorption, *Scripta Materialia*, 190 (2021) 46.
- [25] S. Mooraj, S.S. Welborn, S. Jiang, S. Peng, J. Fu, S. Baker, E.B. Duoss, C. Zhu, E. Detsi, W. Chen, Three-dimensional hierarchical nanoporous copper via direct ink writing and dealloying, *Scripta Materialia*, 177 (2020) 146.
- [26] Y. Zhang, W. Chen, D.L. McDowell, Y.M. Wang, T. Zhu, Lattice strains and diffraction elastic constants of cubic polycrystals, *Journal of the Mechanics and Physics of Solids*, 138 (2020): 103899.
- [27] W. Chen, S. Watts, J.A. Mancini, W.L. Smith, C.M. Spadaccini, Isotropic stiff lattices beyond Maxwell criterion, *Science Advances*, 5 (2019): eaaw1937.
- [28] J. Ren, C. Mahajan, L. Liu, D. Follette, W. Chen, S. Mukherjee, Corrosion Behavior of Selectively Laser Melted CoCrFeMnNi High Entropy Alloy, *Metals*, 9 (2019): 1029.
- [29] J.V. Carstensen, R. Lotfi, W. Chen, S. Szyntyski, S. Gaitanos, J. Schroers, J.K. Guest, Topology-optimized bulk metallic glass cellular materials for energy absorption, *Scripta Materialia* 208 (2022) 114361.
- [30] T. Kou, S. Wang, R. Shi, T. Zhang, S. Chiovoloni, J.Q. Lu, W. Chen, M.A. Worsley, B.C. Wood, S.E. Baker, E.B. Duoss, R. Wu, C. Zhu, Y. Li, Periodic Porous 3D Electrodes Mitigate Gas Bubble Traffic during Alkaline Water Electrolysis at High Current Densities, *Advanced Energy Materials*, 2002955 (2020).
- [31] W. Chen, T. Voisin, Y. Zhang, J.-B. Florein, C.M. Spadaccini, D.L. McDowell, T. Zhu, Y.M. Wang, Microscale residual stresses in additively manufactured stainless steel. *Nature Communications*, 10 (2019): 4338.
- [32] C. Zhu, Z. Qi, V.A. Beck, M. Luneau, J. Lattimer, W. Chen, M.A. Worsley, J. Ye, E.B. Duoss, C.M. Spadaccini, C.M. Friend, J. Biener, Toward digitally controlled catalyst architectures: Hierarchical nanoporous gold via 3D printing, *Science Advances*, 4 (2018): eaas9459.
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- [34] M.A. Gibson, N.M. Mykulowycz, J. Shim, R. Fontana, P. Schmitt, A. Roberts, J. Ketkaew, L. Shao, W. Chen, P. Bordeenithikasem, J.S. Myerberg, R. Fulop, M.D. Verminski, E.M. Sachs, Y.M. Chiang, C.A. Schuh, A. J. Hart, J. Schroers, 3D Printing Metals like Thermoplastics: Fused Filament Fabrication of Metallic Glasses, *Materials Today*, 21 (2018) 697-702.
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- [45] Z. Liu, W. Chen, J. Carstense, J. Ketkaew, R. Mota, J.K. Guest, J. Schroers, 3D metallic glass cellular structures, *Acta Materialia*, 105 (2016) 35-43.
- [46] W. Chen, J. Ketkaew, Z. Liu, R. Mota, K.S. O'Brien, J. Schroers, Does the fracture toughness of bulk metallic glasses scatter? *Scripta Materialia*, 107 (2015) 1-4.
- [47] J. Ketkaew, Z. Liu, W. Chen, J. Schroers, Critical crystallization for embrittlement in metallic glasses, *Physical Review Letters*, 115 (2015) 265502.
- [48] W. Chen, Z. Liu, H. Robinson, J. Schroers, Flaw tolerance versus performance: a tradeoff in metallic glass cellular structures, *Acta Materialia*, 73 (2014): 259-274.
- [49] W. Chen, Z. Liu, J. Schroers, Joining of metallic glasses in air, *Acta Materialia*, 62 (2014): 49-57.

## **SERVICE**

### **PROFESSIONAL SERVICE**

- 2023 Guest Editor for journal *Surface and Coatings Technology*
- 2019 – present Editorial Board Member for journal *Scientific Reports*
- 2021 – present Editorial Board Member for journal *Metals and Materials International*
- 2020 Workshop co-organizer, New England Workshop on Opportunities and Challenges for 3D Printing in Highway Infrastructure Construction and Maintenance
- 2020 Session Chair, Northeastern Regional Student Conference of Society for Experimental Mechanics
- 2018 Session Chair, Architected Materials – Synthesis, Characterization, Modeling and Optimal Design Symposium, Materials Research Society Fall Meeting 2018, Boston, MA, USA.

### **JOURNAL REFEREE ACTIVITIES**

- 2014 – present Reviewer for *Nature Communications*, *Science*, *Acta Materialia*, *Physical Review Letters*, *Journal of Mechanics and Physics of Solids*, *International Journal of Plasticity*, *Scripta Materialia*, *Applied Physics Letters*, *Journal of Applied Physics*, *APL Materials*, *Scientific Reports*, *Materials Research Letters*, *Materials Science and Engineering: A*, *Journal of Alloys and Compounds*, *Journal of the Mechanical Behavior of Biomedical Materials*, *Materials & Design*.

- **MEMBERSHIPS**

2023 – present American Society of Mechanical Engineers (ASME)

2015 – present Association of The Minerals, Metals & Materials Society (TMS)

2015 – present Association of Materials Research Society (MRS)