Curriculum Vitae

Wen Chen, Ph.D.
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DESCRIPTION

Dr. Wen Chen's research focuses on additive manufacturing, metallurgy, architected materials, and mechanical behavior of materials. Dr. Chen directs the Multi-scale Materials and Manufacturing Laboratory in the Department of Aerospace and Mechanical Engineering 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 –	**Associate Professor** (with tenure), Department of Aerospace and Mechanical Engineering, University of Southern California, USA
06/2024 – 12/2024	**Associate Professor** (with tenure), Department of Mechanical and Industrial Engineering, University of Massachusetts Amherst, USA
09/2018 – 05/2024	**Assistant Professor**, Department of Mechanical and Industrial Engineering, University of Massachusetts Amherst, USA
12/2015 – 08/2018	**Postdoctoral Research Scientist**, Materials Engineering Division, Lawrence Livermore National Laboratory, USA

HONORS AND AWARDS

2024	Barbara H. and Joseph J. Goldstein Outstanding Junior Faculty Award, UMass Amherst
2023	35 Emerging Young Investigators Under 35(ish) highlighted by journal *Matter*
2023	NSF CAREER Award
2022	SME Outstanding Young Manufacturing Engineer
2016	Best Poster Award, 11th International Bulk Metallic Glass Conference, Washington University at St. Louis., USA.
2016	Acta Student Award, Acta Materialia
2016	Chinese Scholarship Council for Outstanding Oversea Students
2015	Pierre W. Hoge Fellowship, Yale University
2015	Outstanding Reviewer, Materials Science and Engineering: A

PEER REVIEWED PUBLICATIONS (Students/postdocs advised by me are underlined)

- **Book Chapter**

  [1] S. Guan, W. Chen, Additive Manufacturing of High-Entropy Alloys: Microstructural Metastability and Mechanical Properties, High-Entropy Materials: Theory, Experiments, and Applications, 239-286, 2021.

- **Peer Reviewed Journal Papers** (*corresponding author. Google Scholar: Total citation: >6300, H-index: 36)

[1] X. Gao, J. Liu, L. Bo, **W. Chen***, J. Sun, Z. Ning, A. HW Ngan, Y. Huang, Achieving superb mechanical properties in CoCrFeNi high-entropy alloy microfibers via electric current treatment, **Acta Materialia**, 277 (2024) 120203.

[2] 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.

[3] 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 $AlCrFe_2Ni_2$ high-entropy alloys through engineering phase transformation pathway, **Communications Materials**, 5 (2024) 101.

[4] J. Zeng, Y. Yang, H. Peng, P. Wang, C. Liu, Z. Chen, **W. Chen**, X. Liu, Y. Wu, Z. Liu, Z. Lu, Additive manufacturing of high entropy shape memory alloy with outstanding properties through multi-remelting in-situ alloying, **Additive Manufacturing**, 2024, 104253

[5] 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.

[6] 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.

[7] K. Katagiri, S.J. Irvine, A. Hari, R. Kodama, N. Ozaki, T. Sano, J. Ren, W. Yang, **W. Chen**, M.P. Clay, A.D. Pope, S. Iwan, L.E. Dresselhaus-Marais, Y.K. Vohra, Static and shock compression studies of eutectic high-entropy alloy $AlCoCrFeNi_{2.1}$ to ultrahigh pressures, **Journal of Applied Physics**, 135 (2024) 095902. **(Featured Article Selected by Editor)**

[8] T. Keller, W. Yang, **W. Chen**, I. Baker, Additive manufacturing of Mn-Al permanent magnets via laser powder bed fusion, **Materialia**, 33 (2024) 101978.

[9] 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. **(Featured Article Selected by Editor)**

[10] S. Feng, S. Guan, X. Liu, S. Peng, K. Dong, Y. Yang, X. Chen, Y. Liang, Q. Wang, Y. Liu, Y. Peng, K. Wang, **W. Chen***, J. Kong*, Lightweight Co-free eutectic high-entropy alloy with high strength and ductility by casting, **Materials Research Letters**, 12 (2024) 26-33.

[11] E. Tekoğlu, A.D. O'Brien, J. Bae, K. Lim, J. Liu, S. Kavak, Y. Zhang, S.Y. Kim, D. Ağaoğulları, **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.

[12] 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.

[13] 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.

[14] H. Ding, P. Gong, **W. Chen**, Z. Peng, H. Bu, M. Zhang, X. Tang, J. Jin, L. Deng, G. Xie, X. Wang, K. Yao, J. Schroers, Achieving strength-ductility synergy in metallic glasses via electric current-enhanced structural fluctuations, **International Journal of Plasticity**, 169 (2023) 103711.

[15] J. Fu, S. Mooraj, A. Ng, C. Zhu, **W. Chen***, E. Detsi*, Sub-100 mA/cm^2 CO_2-to-CO Reduction Current Densities in Hierarchical Porous Gold Electrocatalysts Made by Direct Ink Writing and Dealloying, **ACS Applied Materials & Interfaces,** 15 (2023) 27905.

[16] Y. Liu, J. Ren, J. Liu, Y. Cao, W. Liu, T. Li, Y. Zhu, **W. Chen***, Exceptional thermal stability of additively manufactured CoCrFeMnNi high-entropy alloy with cellular dislocation structures, **Materials Science and**

Engineering: A, 885 (2023): 145650.
[17] X. Gao, J. Liu, W. Fu, Y. Huang*, Z. Ning, Z. Zhang, J. Sun, **W. Chen***, Strong and ductile CoCrFeNi high-entropy alloy microfibers at ambient and cryogenic temperatures, **Materials & Design** 233 (2023): 112250.
[18] S. Mooraj, **W. Chen***, A Review on High-Throughput Development of High-Entropy Alloys by Combinatorial Methods, **Journal of Materials Informatics**, 3 (2023) 4. **(Invited Review)**
[19] Y. Liu, J. Ren, S. Guan, C. Li, Y. Zhang, S. Muskeri, Z. Liu, D. Yu, Y. Chen, K. An, Y. Cao*, W. Liu, Y. Zhu, W. Chen, S. Mukherjee, T. Zhu, **W. Chen***, Microstructure and Mechanical Behavior of Additively Manufactured CoCrFeMnNi High-Entropy Alloys: Laser Directed Energy Deposition versus Powder Bed Fusion, **Acta Materialia**, 250 (2023) 118884.
[20] 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.
[21] S. Feng, S. Guan, S. Zhang, S. Mooraj, M. Luebbe, X. Fan, K.A. Beyer, T. Li, J. Liu, J. Kong, P.K. Liaw, H. Wen, S. Gerasimidis*, **W. Chen***, Ultrafine-grained Fe-TiB2 high-modulus nanocomposite steel with high strength and isotropic mechanical properties by laser powder bed fusion, **Additive Manufacturing**, 70 (2023) 103569.
[22] 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.
[23] 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. **(Highlighted by MIT News, AM Chronicle)**
[24] 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. **(Featured Article Selected by Editor)**
[25] D. Zhao, Y. Guo, R. Lai, Y. Wen, P. Wang, C. Liu, Z. Chen, C. Yang, S. Li, **W. Chen**, Z. Liu, Abnormal three-stage plastic deformation in a 17-4 PH stainless steel fabricated by laser powder bed fusion, **Materials Science and Engineering: A** 858 (2022) 144160.
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[28] 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. **(Highlighted by ScienceDaily, Phys.org.)**
[29] 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.
[30] 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.
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[32] S. Zhang, P. Hou, S. Mooraj, **W. Chen***, Printability of Zr41.2Ti13.8Cu12.5Ni10.0Be22.5 metallic glass

on steel by laser additive manufacturing: A single-track study, **Surface and Coatings Technology**, 428 (2021) 127882.

[33] 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. **(Invited Review)**

[34] P. Hou, S. Mooraj, V.K. Champagne, M.J. Siopis, P.K. Liaw, S. Gerasimidis*, **W. Chen***, Effect of Build Height on Temperature Evolution and Thermally Induced Residual Stresses in Plasma Arc Additively Manufactured Stainless Steel. **Metallurgical and Materials Transactions A** 53 (2022) 627.

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[42] 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.

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[44] 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.

[45] Y. Guo, L. Liu, W. Zhang, K.D. Yao, **W. Chen**, J. Ren, J.G. Qi, B. Wang, Z.F. Zhao, J. Shang, Y. Zhang, J. Xiang, A new method for preparing high entropy alloys: Electromagnetic pulse treatment and its effects on mechanical and corrosion properties, **Materials Science and Engineering: A**, 774 (2020): 138916.

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[49] J.V. Carstensen, R. Lotfi, **W. Chen**, S. Szyniszewski, S. Gaitanaros, J. Schroers, J.K. Guest, Topology-optimized bulk metallic glass cellular materials for energy absorption, **Scripta Materialia** 208 (2022) 114361.

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during Alkaline Water Electrolysis at High Current Densities, **Advanced Energy Materials**, 2002955 (2020).

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[59] **W. Chen**, H.F. Zhou, Z. Liu, J. Ketkaew, L. Shao, N. Li, P. Gong, W. Samela, H.J. Gao, J. Schroers, Test sample geometry for fracture toughness measurements of bulk metallic glasses, **Acta Materialia**, 145 (2018) 477-478.

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PATENTS:

[1] **W. Chen**, J. Liu, Article comprising non-weldable superalloys and methods of manufacture thereof. Under preparation, 2023.

[2] Z. Qi, J. Biener, **W. Chen**, E. Duoss, C. Spadaccini, M.A. Worsley, J. Ye, C. Zhu, Hierarchical porous metals with deterministic 3D morphology and shape via dealloying of 3D printed alloys, US Patent Appl. No. 15/790,810, 2019.

[3] J. Ye, J. Biener, P. Campbell, **W. Chen**, J.A. Jackson, B.D. Moran, J. Oakdale, W. Smith, C.M. Spadaccini, M.A. Worsley, X. Zheng, Three-dimensional deterministic graphene architectures formed using three-dimensional templates, US Patent Appl. No. 15/417134, 2017.

[4] J. Schroers, **W. Chen**, Z. Liu, Joining of metallic glasses in air, US Patent 9764418, 2017.

[5] J. Schroers, Z. Liu, M. Kanik, **W. Chen**, P. Bordeenithikasem, R. Mota, J. Ketkaew, Method and system of fabricating bulk metallic glass sheets, US Patent Appl. No. 15/106487, 2016. (Highlighted by Phys.org and other media reports., licensed by Supercool Metals Inc.)

INVITED TALKS AND SEMINARS:

[1] **W. Chen**, Additive Manufacturing of Emerging Complex Alloys, **Gordon Research Conferences,** Les Diablerets, Switzerland, May 2024.

[2] **W. Chen**, Additive Manufacturing of Emerging Complex Alloys, **Society of Engineering Science (SES) Annual Technical Meeting**, Minneapolis, Oct 2023.

[3] **W. Chen**, Additive Manufacturing of Emerging Complex Alloys with Engineered Structures, **Worcester Polytechnic Institute**, April 2023.

[4] **W. Chen**, Additive Manufacturing of Emerging Complex Alloys, **Advanced Engineering Materials Workshop**, Lawrence Livermore National Laboratory, March 2023.

[5] **W. Chen,** Additive Manufacturing of Compositionally Complex Alloys, **TMS Annual Meeting & Exhibitio**n, San Diego, CA, March 2023.

[6] **W. Chen**, Additive Manufacturing of Emerging Complex Alloys with Engineered Structures, **University of Southern California**, March 2023.

[7] **W. Chen**, Additive Manufacturing of Compositionally Complex Alloys with Engineered Microstructures, Telluride High-Entropy Materials Workshop, **University of Pennsylvania**, October 2022.

[8] **W. Chen**, Additive Manufacturing of High-Entropy Alloys, **Telluride High-Entropy Materials Workshop**, June 2022.

[9] S. Mooraj, **W. Chen,** Additive Manufacturing of High-performance Compositionally Complex Metal Alloys, **TMS Annual Meeting & Exhibition**, Anaheim, CA, March 2022.

[10] J. Ren, **W. Chen,** Additive Manufacturing of High-entropy Alloys for High Strength and Lightweight Structures, **TMS Annual Meeting & Exhibitio**n, Anaheim, CA, March 2022.

[11] **W. Chen**, Additive Manufacturing of Compositionally Complex Alloys, **Shanghai University**, November 2021.

[12] **W. Chen**, Materials with Engineered Microstructures by Additive Manufacturing, **National University of Singapore**, August 2021.

[13] **W. Chen,** Additive Manufacturing of Bulk Metallic Glasses and High-Entropy Alloys, **MEPhI Winter School** in Moscow, Russia, December 2020.

[14] **W. Chen**, L. Thornley, D. Apelian, A. Pascall, E. Duoss, J. Kuntz, C. Spadaccini, Direct Metal Writing: Controlling the Rheology through Microstructure, **TMS Annual Meeting & Exhibition**, Phoenix, AZ, March 2018.

[15] **W. Chen**, Materials with Engineered Microstructures, **University of Toronto**, Toronto, ON, Canada, April 2017.

[16] **W. Chen**, Additive Manufacturing: Opportunities for Future, **Missouri University of Science and Technology**, February 2017.

[17] **W. Chen**, Materials Design by Additive Manufacturing, **George Mason University**, January 2017.

[18] **W. Chen**, Additive Manufacturing: Opportunities for Materials and Manufacturing Design, **University of Massachusetts, Amherst**, MA, March 2017.

[19] **W. Chen**, Z. Liu, J. Ketkaew, J. Schroers, 3D Metallic glass architectures, **MRS Fall Meeting**, Boston, MA, November 2016.

[20] **W. Chen**, Z. Liu, J. Ketkaew, J. Schroers, Flaw Tolerance of Metallic glasses. **11th International Bulk Metallic Glasses Conference**, Washington University in St. Louis, MO, June 2016.

[21] **W. Chen**, Z. Liu, J. Schroers, Joining of active bulk metallic glasses in air. **TMS Annual Meeting & Exhibition**, San Diego, CA, February 2014.

SERVICE

• PROFESSIONAL SERVICE

2023 – present Editorial Board Member for journal ***Materials Futures***
2023 Symposium organizer, Additive Manufacturing Symposium, MRS Fall Meeting 2023.
2023 Guest Editor for journal ***Surface and Coatings Technology***
2022 Guest Editor for ***Journal of Materials Informatics***
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, Advanced Materials, Acta Materialia, Physical Review Letters, Additive Manufacturing, Journal of Mechanics and Physics of Solids, International Journal of Plasticity, Scripta Materialia, Applied Physics Letters, Journal of Applied Physics, Journal of Manufacturing Processes, 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, Journal of Materials Science*.

• GRANT PROPOSAL REFEREE ACTIVITIES

2019 – present Reviewer for DOE proposals
2021 – present Panelist/Reviewer for NSF (e.g., DMR-MMN, CMMI-AM) proposals

MEMBERSHIPS

2023 – present American Society of Mechanical Engineers (ASME)
2022 – present Society of Manufacturing Engineers (SME)
2015 – present Association of The Minerals, Metals & Materials Society (TMS)
2015 – present Association of Materials Research Society (MRS)