**Ying Yang, Ph.D.**

Senior Research Staff, Alloy Behavior and Design Group

Materials Science and Technology Division, Oak Ridge National Laboratory

One Bethel Valley Road, P.O. Box 2008, Oak Ridge, TN 37831-6115

Phone: 865-576-4427; E-mail:yangying@ornl.gov

**Education and Training**

University of Wisconsin-Madison Materials Science & Engineering Postdoctoral 2005

University of Wisconsin-Madison Materials Science & Engineering Ph. D. 2004

Central South University Materials Science & Engineering B.S. 1996

**Research and Professional Experience**

2019-present Senior Research Staff Oak Ridge National Lab

2016-2018 Research Staff Oak Ridge National lab

2012-2015 Associate Research Staff Oak Ridge National Lab

2005-2010 Materials Scientist Computherm LLC.

**Research Area**

Understand thermodynamics, kinetics, phase stability and phase transformation on microstructure and mechanical behavior of metals and alloys.

**Selected Recent Publications**

1. Zarkadoula, E., **Yang, Y**., Borisevich, A., & George, E. Effects of precipitate size and spacing on deformation-induced fcc to bcc phase transformation. Materials Research Letters, 10(9), 585-592. (2022).
2. Gadelmeier, C., **Yang, Y**., Glatzel, U., & George, E. P. Creep strength of refractory high-entropy alloy TiZrHfNbTa and comparison with Ni-base superalloy CMSX-4. Cell Reports Physical Science, 100991. (2022).
3. Zhang, C., & **Yang, Y.** The CALPHAD approach for HEAs: Challenges and opportunities. MRS Bulletin, 1-10. (2022).
4. Michi, RA., Sisco K., Bahl, S., **Yang**, Y., Poplawsky, JD., Allard, L., Dehoff, R., Plotkowski, A., and Shyam A. "A creep-resistant additively manufactured Al-Ce-Ni-Mn alloy." Acta Materialia 227 (2022): 117699.
5. Tan, L., Poplawsky, J. D., & **Yang, Y**. Effects of niobium and tantalum on the microstructure and strength of ferritic-martensitic steels. Materials Science and Engineering: A, 807, 140900. (2021).
6. Bahl S., Sisco K., **Yang Y.**, Theska F., Primig S., Allard L., Michi R., Fancher C., Stump B., Dehoff. R, Microstructure and mechanical properties of high-temperature Al-Cu-Ce and Al-Cu-Ce-Zr alloys produced by additive manufacturing, ***Additive Manufacturing***, 48(2021):102404.
7. **Yang, Y**., Chen, T., Tan, L., Poplawsky, J.D., An, K., Wang, Y., Samolyuk, G.D., Littrell, K., Lupini, A.R., Borisevich, A. and George, E.P., (2021). Bifunctional nanoprecipitates strengthen and ductilize a medium-entropy alloy. ***Nature***, 595(7866), pp.245-249.
8. Zhong, W., **Yang, Y.**, Field, K.G., Sridharan, N., Terrani, K. and Tan, L., 2021. Microstructure and mechanical properties of high Mn-containing ferritic-martensitic alloys exposed to cyclical thermal treatment. ***Materials Science and Engineering: A***, 813, p.141143.
9. Plotkowski, A., Sisco, K., Bahl, S., Shyam, A., **Yang, Y.**, Allard, L., Nandwana, P., Rossy, A.M. and Dehoff, R.R., 2020. Microstructure and properties of a high temperature Al–Ce–Mn alloy produced by additive manufacturing. ***Acta Materialia***, 196, pp.595-608.
10. Sisco, K., Plotkowski, A., **Yang, Y.**, Leonard, D., Stump, B., Nandwana, P., Dehoff, R.R. and Babu, S.S., 2021. Microstructure and properties of additively manufactured Al–Ce–Mg alloys. ***Scientific reports***, 11(1), pp.1-14.
11. **Yang, Y**., Samolyuk, G. D., Chen, T., Poplawsky, J. D., Lupini, A. R., Tan, L., & Ken, L. (2020). Coupling computational thermodynamics with density-function-theory based calculations to design L12 precipitates in FeNi based alloys. ***Materials & Design***, 191, 108592.
12. Wang, L., Zheng, C., Kombaiah, B., Tan, L., Sprouster, D. J. ... & **Yang, Y**\*. (2020). Contrasting roles of Laves\_Cr2Nb precipitates on the creep properties of novel CuCrNbZr alloys. ***Materials Science and Engineering: A***, 779, 139110.
13. **Yang, Y**., Bahl, S., Sisco, K., Lance, M., Shin, D., Shyam, A. & Dehoff, R. R. (2020). Primary solidification of ternary compounds in Al-rich Al–Ce–Mn alloys. ***Journal of Alloys and Compounds***, 844, 156048.
14. **Yang, Y**., Wang, L., Snead, L., & Zinkle, S. J. (2018). Development of novel Cu-Cr-Nb-Zr alloys with the aid of computational thermodynamics. ***Materials & Design***, 156, 370-380.
15. Song, M., **Yang, Y**., Wang, M., Kuang, W., Lear, C. R., & Was, G. S. (2018). Probing long-range ordering in nickel-base alloys with proton irradiation. ***Acta Materialia***, 156, 446-462.

**US Patents**

* Yang, Y., Pint, BA., Poplawsky, JD., and Tan L.. "Ta-containing Fe-Ni based superalloys with high strength and oxidation resistance for high-temperature applications." U.S. Patent 11,255,003, issued February 22, 2022.
* Maziasz, PJ., Govindarajan M., Pint BA., Unocic KA., and Yang Y.. "Low-cost cast creep-resistant austenitic stainless steels that form alumina for high temperature oxidation resistance." U.S. Patent 11,193,190, issued December 7, 2021.

**Synergistic Activities**

* PI of “Development of Castable Nanostructural Alloys for Fusion First Wall/Blanket applications” supported by DOE ARPAE-FES-GAMOW program (2021-present)
* PI of “Metastability driven design of AM Al superalloys” supported by LDRD program (2021-present)
* Co-PI of “Multiscale mechanical properties and alloy design” supported by DOE BES program (2018 – 2022)
* Co-PI of “Plasma Facing Component Innovations by Advanced Manufacturing and Design” supported by DOE ARPAE-FES-GAMOW program (2021-present)
* Task leader of “Fundamentals of non-equilibrium processing for advance manufacturing of future engines” supported by DOE EERE program (2019 – present)
* Principle investigator of development of novel Copper alloys for fusion applications supported by DOE-BES-FE (2015 –2021).
* Principle investigator of “A design basis of future Fe-based super alloys” supported by LDRD Materials Innovation Initiative (2016 – 2019)
* Member of Alloy Phase Diagram (APD) Committee of ASM, Alloy Phase Committee and Young Leader Committee of TMS
* Editorial committee member of *Journal of Phase Equilibria and Diffusion*

**Invited Talks and Awards**

* 2022 R&D100 award winner, Aug. 2022, https://www.ornl.gov/news/seven-ornl-technologies-win-rd-100-research-awards-0
* 2021 UT-Battelle Outstanding Scholarly Output award, Dec. 2021, For the demonstration of a novel approach that combines theory, modeling and precision synthesis to increase alloy strength and ductility simultaneously by controlling the matrix strengthening and phase evolution of nanoprecipitates.
* Invited talk, “A Novel Design of Transitional Layer Structure Between A Reduced Activation Ferritic Martensitic Steel and Tungsten”, at International Conference of Fusion Reactor Materials, Madrid, Spain 2021(online conference)
* Invited talk, “Utilizing nanoprecipitates to modulate phase transformation, strength, and ductility of HEAs”, at 2nd World Congress on High Entropy Alloys (HEA 2021)
* Invited talk, “Utilizing Nanoprecipitates to Modulate Phase Transformation, Strength and Ductility of HEAs”, at Symposium “High-entropy and compositionally complex alloys”, MRS Fall meeting 2020
* Young Leader Professional Development Award, TMS annual meeting 2009
* Best Student Poster at the TMS 2003 Annual Meeting, San Diego, CA