



Exponent[®]
Engineering & Scientific Consulting

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Professional Profile

Dr. Lindemann specializes in materials science and metallurgy with specific expertise in the solidification and growth kinetics of metals, including Al and Zn alloys, among others. Prior to joining Exponent, Dr. Lindemann completed his Ph.D. in Materials Science and Engineering at the University of Michigan Ann Arbor. His research employed recent developments in X-ray imaging and machine learning to deepen our understanding of pattern formation and evolution within multi-phase alloys which affect material properties and may be used to improve predictions on service life. Through his research, Dr. Lindemann also gained proficiency in material synthesis, advanced data analysis techniques, and material thermodynamics

Dr. Lindemann previously was a research scientist at Ames National Laboratory. In this role, he designed experimental procedures intended to manufacture previously unknown ceramic compounds and characterize their novel magnetic properties and propensity for superconductivity.

Dr. Lindemann has expertise in a wide range of characterization techniques, including scanning electron microscopy (SEM), electron backscatter diffraction (EBSD), focused ion beam milling (FIB), and X-ray transmission tomography. He is also well versed in data analytics, image processing, and machine learning, especially genetic optimization.

Academic Credentials & Professional Honors

Ph.D., Material Science and Engineering, University of Michigan, Ann Arbor, 2024

B.S., Materials Engineering, Iowa State University, 2018

Materials Science and Engineering Leadership and Service Award, 2018

Publications

Lindemann GR, Chao P, Nikitin V, Andrade V, de Graef M, Shahani AJ. Complexity and evolution of a three-phase eutectic during coarsening uncovered by 4D nano-imaging. *Acta Materialia* 2024, 266.

Lindemann GR, Chao P, Hunter AH, Shahani AJ. Formation of three-phase eutectic grains on primary phases: Observations from correlative imaging. *Journal of Alloys and Compounds* 2022, 923.

Chao P, Lindemann GR, Hunter AH, Shahani AJ. Pseudo-4D view of the growth and form of locked eutectic colonies. *Acta Materialia* 2022, 240.

Lindemann GR, Shahani AJ. Accelerated discovery of the Al–Ag₂Al–Al₂Cu eutectic coupled zone through genetic optimization. *Journal of Alloys and Compounds* 2020, 827.

Das P, Sangeetha NS, Lindemann GR, Heitmann TW, Kreyssig A, Goldman AI, McQueeney RJ, Johnston DC, Vaknin D. Itinerant G-type antiferromagnetic order in SrCr₂As₂. Physical Review B 2017, 96.

Presentations

Lindemann GR, Chao P, Shahani AJ. Complexity and evolution of a three-phase eutectic uncovered by 4D X-ray nano-tomography. Poster presentation. Directionally Solidified Eutectics Conference – VII, 2023.

Lindemann GR, Aramanda SK, Shahani AJ. Peering into peritectic microstructure in three dimensions. Oral presentation. Directionally Solidified Eutectics Conference – VII, 2023.

Lindemann GR, Chao P, Shahani AJ. Formation of three-phase eutectic grains on primary phases: Observation from correlative imaging. Oral presentation. The Minerals, Metals, & Materials Society, 2022.

Lindemann GR, Shahani AJ. Accelerated discovery of the Al-Ag₂Al-Al₂Cu eutectic coupled zone through genetic optimization, Oral presentation. The Minerals, Metals, & Materials Society, 2020.