

Cameron J. Lerch

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(816) 805-5285

Education	Yale University	Aug. 2019 - present
	M.S. Mechanical Engineering and Materials Science	
	MPhil Mechanical Engineering and Materials Science	
	Missouri University of Science and Technology	May 2019
	B.S. Physics	GPA: 3.9/4.0
	Minors: Mathematics, Philosophy, Geology	
Experience	Yale University	New Haven, CT
	Intelligent Autonomy Lab	Dec. 2021 – present
	<ul style="list-style-type: none">Developed novel control algorithms for autonomous search and exploration tasks using multi-robot systemsImplemented collision avoidance for safe autonomous search and exploration in cluttered environmentsCarried out real-world and simulated experiments using teams of drones	
	O’Hern Research Group	July 2019 – Dec. 2021
	<ul style="list-style-type: none">Conducted molecular dynamics simulations of EAM and Lennard-Jones models of binary alloys to measure the critical cooling rate (1st year)Studied clogging of deformable particles in hopper flows using the soft particle model via LAMMPS (2nd -3rd year)	
	Summer Undergraduate Research Fellow – Amorphous Materials	June 2018 – Aug. 2018
	<ul style="list-style-type: none">Researched material properties of bulk metallic glasses (BMGs) with Dr. Corey O’HernPerformed MD simulations of BMGs using LAMMPSCalculated rearrangement statistics during cyclic deformation to characterize ductility	
	Missouri University of Science and Technology	Rolla, MO
	Undergraduate Research – Monte Carlo Simulations of Diluted Hexaferrites	Aug. 2017 – May 2019
	<ul style="list-style-type: none">Performed realistic Monte Carlo simulations of diluted hexaferrites with Dr. Thomas VojtaProgrammed parallelized code to run large-scale simulationsResearched the shape of the ferrimagnetic - paramagnetic phase boundary	
	Undergraduate Research – Experimental Atomic, Molecular, and Optical Physics	Jan. 2017 – May 2019
	<ul style="list-style-type: none">Hands on experience with high power lasers and optics in Dr. Daniel Fischer’s labInvestigated orbital angular momentum using a laser and a spatial light modulatorUsed MATLAB to explore various diffraction gratings to determine the optimal setup	
	Undergraduate Research – Quantum Phase Transitions	Oct. 2016 – May 2019
	<ul style="list-style-type: none">Focused primarily on the phase transition from an insulator to a superfluid with Dr. Thomas VojtaTasked to incorporate the stiffness parameter into the XY-model for this phase transitionUtilized the Pegasus IV Cluster to run large systems to calculate the stiffness	
	Peer Learning Assistant	Aug. 2016 – May 2019
	<ul style="list-style-type: none">Tutored students in Engineering Physics I and Engineering Physics IIWorked alongside faculty during LEAD sessions to help guide students through the course materialDemonstrated and explained fundamental concepts to help students develop problem solving skills	

Publications A. Seewald, **C. Lerch**, M. Chancán, A. Dollar, I. Abraham, *Energy-Aware Ergodic Search: Continuous Exploration for Multi-Agent Systems with Battery Constraints*, 2024 IEEE ICRA, arXiv:2310.09470
C. Lerch, D. Dong, I. Abraham, *Safety-Critical Ergodic Exploration in Unknown Environments via Control Barrier Functions*, 2023 IEEE ICRA, arXiv:2211.04310
 G. Khairnar, **C. Lerch**, T. Vojta, *Phase Boundary Near a Magnetic Percolation Transition*, Eur. Phys. J. B (2021), arXiv:2011.03390
 J. Crewse, **C. Lerch** and T. Vojta, *Quantum critical behavior of a three-dimensional superfluid-Mott glass transition*, Phys. Rev. B 98, 054514
C. Lerch and T. Vojta, *Superfluid density and compressibility at the superfluid-Mott glass transition*, Eur. Phys. J. Spec. Top. (2019), arXiv:1712.08245

Presentations **C. Lerch** and C. O’Hern, *Encoding Multidirectional Memory in Sheared Amorphous Solids*, Leadership Alliance National Symposium, Hartford, CT (27 July 2018)
C. Lerch and T. Vojta, *Monte Carlo simulations of the magnetic behavior of diluted hexaferrites*, APS March Meeting, Los Angeles, CA (9 Mar 2018)
 T. Vojta, J. Crewse, and **C. Lerch**, *Quantum critical behavior of a three-dimensional superfluid-Mott glass transition*, APS March Meeting, Los Angeles, CA (8 Mar 2018)

Computer Skills	Python	MATLAB	C++	Fortran 90	ROS	LAMMPS	Linux
	Autodesk Inventor		SolidWorks	Siemens NX	Origin Graphing and Analysis		

Honors & Activities
 2019 NSF GRFP recipient
 2019 Undergraduate Research Day at the Capitol – selected participant
 2018 Yale University CRISP Summer Undergraduate Research Fellow
 47th Annual Missouri S&T Fuller Poster Competition - winner
 Sigma Pi Sigma Physics Honors Society
 Society of Physics Students
 S&T Astronomical Research Society – former Vice President
 2014 FIRST Dean’s List Finalist