Kevin Chu, PhD Candidate Materials Science - Georgia Tech

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The online version is available at https://kvnchv.github.io/cv

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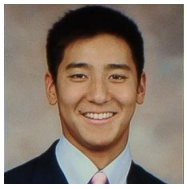

I am a graduate research assistant pursuing my PhD in Materials Science under Dr. David L. McDowell at the Georgia Institute of Technology. My expertise lies in molecular dynamics and scientific software development. My research focuses primarily on physics-based atomistic and coarse-grained atomistic modeling of multicomponent alloys and fundamental deformation processes at the nanoscale.

Education

- **Georgia Institute of Technology** -- PhD Materials Science and Engineering (Projected 2022)
- **University of California, Los Angeles** -- B.S. Materials Science and Engineering 2017

Publications

2020

- Chu, K., Foster, M. E., Sills, R. B., Zhou, X., Zhu, T., & McDowell, D. L. (2020). Temperature and composition dependent screw dislocation mobility in austenitic stainless steels from large-scale molecular dynamics. npj Computational Materials, 6(1), 1-10.
- Spataru, C.D., Chu, K., Sills, R.B. Zhou, X. (2020). Molecular Statics Analyses of Thermodynamics and Kinetics of Hydrogen Cottrell Atmosphere Formation Around Edge Dislocations in Aluminum. JOM 72, 3020–3027 .

2018

- Chu, K., Gruber, J., Zhou, X. W., Jones, R. E., Lee, S. R., & Tucker, G. J. (2018). Molecular dynamics studies of InGaN growth on nonpolar (11 2^{-} 0) GaN surfaces. Physical Review Materials, 2(1), 013402.

2017

- Zhou, X. W., Jones, R. E., & Chu, K. (2017). Polymorphic improvement of Stillinger-Weber potential for InGaN. Journal of Applied Physics, 122(23), 235703.

Conference presentations

Chu, K., Chen, D., Diaz, A., Selimov, A., Chen, Y., Zhu, T., McDowell, D. (2019). *Application of the concurrent atomistic-continuum (CAC) method to dislocation reaction pathway modeling in FCC metals.* at Materials Science and Technology, Portland, OR

Research experience

Georgia Institute of Technology Atlanta, GA

Graduate Research Assistant - David L. McDowell Group

Aug 2018 - Present

I design and execute multiscale modeling experiments using LAMMPS and custom simulation codes to elucidate novel nanoscale deformation mechanisms in multicomponent alloys. This comprises:

- software development activities to improve or extend existing methods relevant to the Concurrent Atomistic-Continuum (CAC) method
- co-development of LAMMPS-CAC integration and validation
- simulation/analysis pipelining using a combination of shell and Python scripted workflows, interfacing with high performance computing clusters
- compilation of resultant data for the writing of manuscripts.

education lammps hpc python c++ fortran

Sandia National Laboratories Livermore, CA

Research & Development Graduate Intern

May 2019 - Aug 2019

Executed molecular dynamics modeling and data analysis activities to support the following projects:

- Cottrell atomosphere formation kinetics
- large scale dislocation mobility analysis in 3XX stainless steels

Highlights include the development/implementation of a continuum-scale diffusion model and fully pipelined execution and analysis of multi-parameter space molecular dynamics simulations.

lammps matlab python hpc

Sandia National Laboratories Livermore, CA

Undergraduate Research Intern

May 2017 - Aug 2017

- Analyzed existing datasets from molecular dynamics simulations of InGaN film deposition to investigate threading dislocation nucleation mechanisms and derived critical film thickness relations and parameters.
- Designed and executed simulations to validate melting temperature of newly developed interatomic potentials
- Developed presentations for further internal dissemination and produced a number of visualizations for publication.

lammps hpc

University of California, Los Angeles Los Angeles, CA

Undergraduate Research Assistant - Jaime Marian Group

Mar 2016 - May 2017

I assisted with general research tasks relating to computational materials analysis and modelling. Projects included translation of existing calculation/tools from Matlab into C++ (two temperature model, Green's function, and Lennard-Jones potential calculations)

c++ matlab