

Research Statement

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I do research on stars, broadly defined. Past institutional affiliations include UC Santa Cruz, University of Chicago, School of the Art Institute of Chicago, Clemson University, and Los Alamos National Laboratory. I am currently at Arizona State University where I focus my (continuously funded) research activities on

- ★ Stellar Astrophysics.
Especially the Modules for Experiments for Stellar Astrophysics (MESA) project.
- ★ Explosions.
Emphasis on their progenitor evolution, nucleosynthesis, and multi-messenger signals.
- ★ Seismology. Especially those observed in white dwarfs.
- ★ Chemical evolution.
Growth of every isotope, atom, and molecule at every point in spacetime.
- ★ Astrobiology.
Production and delivery of bioessential elements to habitable systems.
- ★ Gamma-ray astronomy.
Particularly energetic photons from the decay of radionuclides.
- ★ Stellar thermodynamics and nuclear physics.
Stars are gravitationally confined nuclear reactors.
- ★ Software Infrastructure.
Community-driven software is an integral enabler of computation, experiment, theory and a primary modality for advancing 21st Century Science.
- ★ Astronomy Journals.
Especially the evolution of the most cited astronomy & astrophysics articles and journals.
- ★ Digital toolsets for online education at scale.
Effective communication of research that excites, cultivates curiosity, is active, is applicable, is community driven, doesn't discriminate, allows for failure, and sparks new questions.

For details on my current research projects, contact [me](#) and/or visit cococubed.asu.edu.



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