



Andrea Leonard

Graduate Institution: California Institute of Technology

Graduate Discipline: Applied Mechanics

Hometown: Rapid City, SD

Relevant SC Research: Basic Energy Sciences

Research Interest:

My research focuses on the nonlinear dynamic response of ordered granular composite structures. The understanding of their mechanical response will help to design new materials with unprecedented properties. Previous studies of uniform one-dimensional chains of spheres have shown these systems to support the formation and propagation of solitary waves with unique properties stemming from their nonlinear contact interactions. Continued research has shown these granular crystals to present various interesting physical phenomena suggesting their use in a wide range of applications, such as: mechanical systems with tunable acoustic/elastic properties, energy trapping and stress redirecting materials, and as new acoustic devices for vibration control and energy localization and harvesting. I am primarily focused on the design and experimental testing of two-dimensional systems regarding their ability to redirect, trap, and mitigate energy from dynamic impulses and shocks.

About Me:

I enjoy experimental work, since it allows me to observe and really understand interesting physical phenomenon. My personal career goal includes pursuing a research-based position in academia or in a national lab setting where I can continue to work in the field of experimental solid mechanics. I've previously been involved with both

Chi Epsilon and Tau Beta Pi Engineering Honor Societies, and I'm currently a member of Society for Experimental Mechanics (SEM). During my time as a graduate student, I spend two years on the organizing committee for an annual solid mechanics workshop held at Caltech. Additionally, I spent several years as an active member of SOPS, a graduate student organization in the Mechanical and Civil Engineering Department at Caltech. When I'm not in the lab, I also enjoy many of the outdoor activities that Southern California has to offer.



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