



A Community of Educators: Professional Development for Graduate Students Within the Berkeley Compass Project



*Josiah Schwab, Nathaniel Roth, The Berkeley Compass Project
University of California, Berkeley*

◆ Abstract

The Berkeley Compass Project is a self-formed group of graduate and undergraduate students in the physical sciences at UC Berkeley. Our goals are to improve undergraduate physics education, provide opportunities for professional development, and increase retention of students from populations typically underrepresented in the physical sciences. Graduate students, together with upper-level undergraduates, design and run all Compass programs. We strive to create a community of educators that incorporates best practices from the science education literature. Along the way, we develop experience in curriculum development, fundraising, grant writing, interfacing with university administration, and other aspects of running an effective organization. Our experience in Compass leaves us better poised to be successful researchers, teachers, and mentors.

◆ Values / Principles

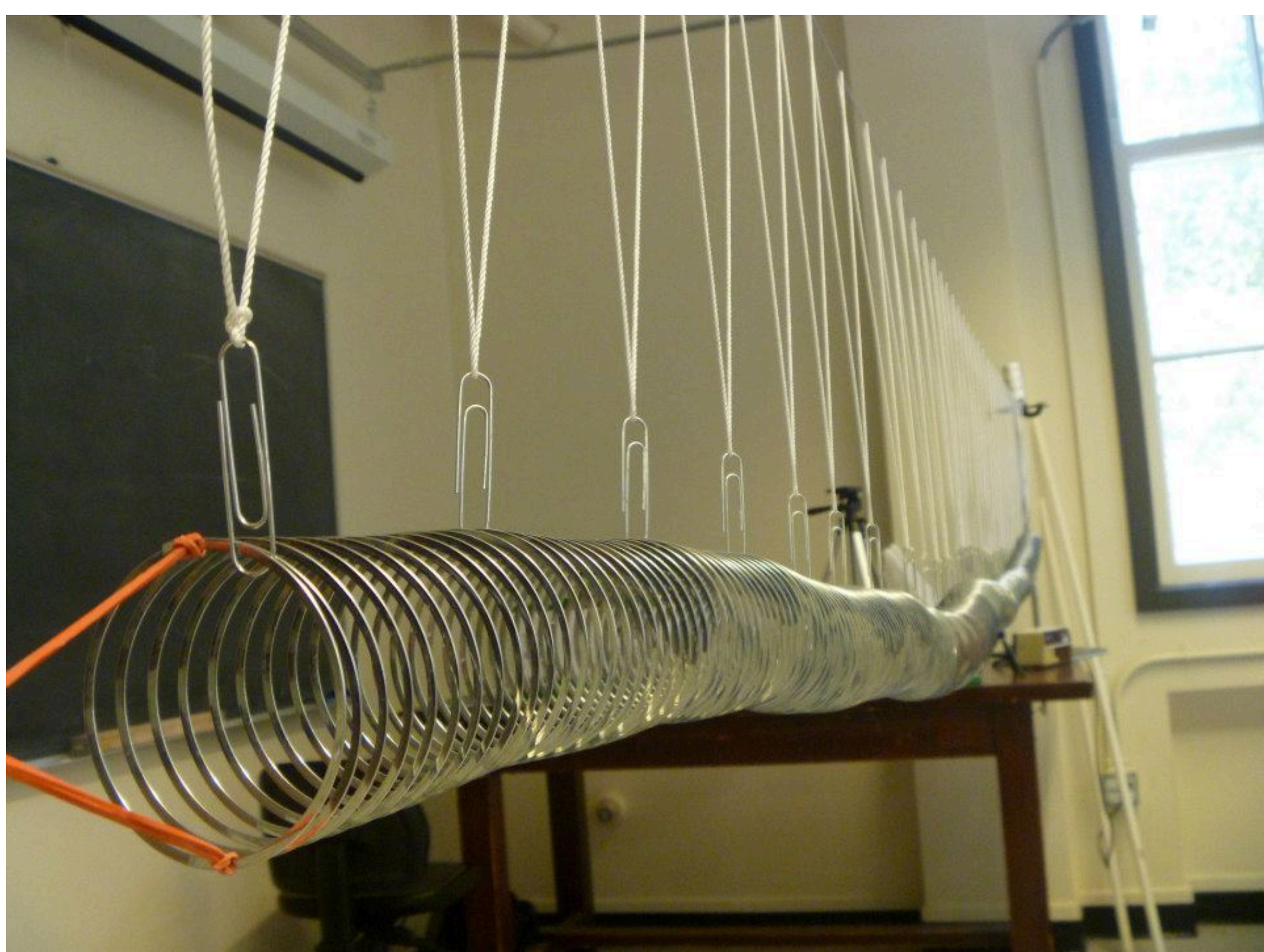
Strong Community

Sense of Ownership

Innovative Pedagogy

Professional Development

◆ Summer Program



The Compass Summer Program is a one or two week residential program for incoming freshmen with declared interest in the physical sciences that takes place immediately before the start of UC Berkeley's fall semester. A group of 4 to 6 graduate students plan and execute the program. In so doing, the instructors explore the education literature and gain experience designing a curriculum. This is a unique opportunity for graduate students to have complete control over a classroom and the freedom to experiment with innovative pedagogy.

“ Teaching for the summer program was one of the highlights of my time at Berkeley. Designing a course from the group up is a challenge, but watching the students engage with the material was exciting! ”

The Compass classroom is typically centered around small and large group discussions, which are moderated, but never dominated, by the instructors. All classrooms are co-taught by multiple graduate students, reflecting the Compass attitude that everyone can benefit from group work and collaboration.

◆ Acknowledgments

JS and NR thank everyone in the Berkeley Compass Project for their support and collaboration. They thank the Student Opportunity Fund for providing support to attend this conference. JS is supported by the National Science Foundation Graduate Research Fellowship Program under Grant No. DGE 1106400. The Berkeley Compass Project thanks the departments of Physics, Astronomy, and Earth & Planetary Sciences, the college of Letters & Sciences, and private donors for the funds that make what we do possible.

◆ Courses

Compass runs a series of seminar courses which have the goal of training undergraduates in key aspects of scientific practice, such as model-building and error analysis. Undergraduates undertake final projects, in which small groups work with graduate student mentors. These graduate student “PIs” have the opportunity to practice guiding students through the selection, refinement, and exploration of an open-ended research question.



Graduate students serve as the primary instructors for the courses and are able to develop new curricula and revise existing ones. These courses are not static, but an active testbed for new ideas and techniques. The teachers write up the details of their classroom and curriculum design they've learned and submit to an education journal.

“ My teaching experience and work with the Berkeley Compass Project has given me the tools and techniques to construct classrooms consistent with my values ”

◆ Leadership



Both inside and out of the classroom, Compass is entirely student run. Graduate students are responsible for securing funding by submitting grant applications and meeting with department heads and university administrators. Student leaders moderate meetings, plan retreats, recruit new members, and communicate their activities to the broader physics community. These responsibilities provide valuable experience in managing people and running an organization.

“ As a result of my work with Compass, I feel much more prepared to take on the management responsibilities that are an integral part of a career in science, and for which direct training is rarely provided. ”

By virtue of being among the first organizations of its kind, Compass has been a resource for developing similar programs at other institutions. This has led to a national network of educators, many of them Compass alumni, who exchange curricular materials and perspectives. One outgrowth of this network has been an NSF-funded collaboration with education researchers at the University of Maryland to study Compass' impact.

◆ URL

<http://www.berkeleycompassproject.org>

