



A Community of Scientists: Cultivating Scientific Identity Among Undergraduates within the Berkeley Compass Project



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◆ 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. For students who enter as freshmen, the core Compass experience consists of a summer program and several seminar courses. These programs are designed to foster a diverse, collaborative student community in which students engage in authentic research practices and regular self-reflection. Compass encourages undergraduates to develop an identity as a scientist from the beginning of their university experience.

◆ Values / Principles

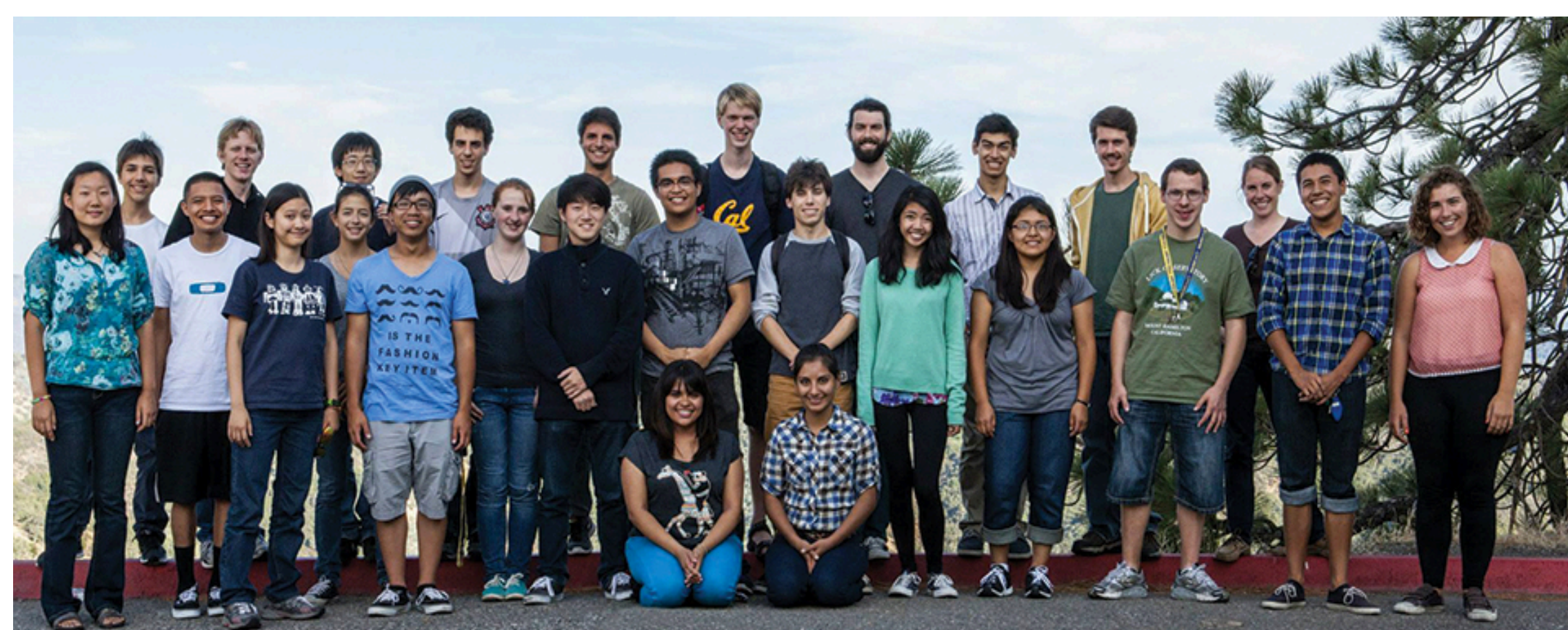
Strong Community

Student Ownership

Challenging Research

Identity as Scientists

◆ Summer Program



“ Having Compass and its community as a first-year student at a large university helped me find my way and transition to Cal. ”

The Compass Summer Program is a one or two week residential program, offered at no cost to participants, that takes place immediately before the start of UC Berkeley's fall semester. During the program, 16 to 20 incoming freshmen come together with a set of graduate student instructors to explore a broad, challenging question, such as “How do wind turbines work?”. The curriculum has an emphasis on model building, experimentation, and problem solving. The classroom setup facilitates group work, collaboration, and hands-on activities.

During the program, Compass students build friendships while living in the same dorm, sharing meals, and working together on problems. In addition to coursework, students in the summer program also participate in activities ranging from lab tours to movie nights.

◆ Acknowledgments

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◆ Courses

Compass' seminar courses encourage students to engage with concepts central to the process of doing science. A course on model-building focuses on taking a complicated physical system and creating a simple, predictive description of that system that can be used to answer questions about it. A course on measurement focuses on designing experimental apparatuses and quantifying uncertainty. These courses are taught the Compass way, with group work, self-discovery, lots of peer interaction and collaboration, and no lectures.



Both classes include final projects that allow them to put these ideas into action by investigating a physical system of their own choosing in a research-like environment. Students communicate their results by giving talks and presenting posters to the broader Berkeley physics community. Students can be proud of the process and their accomplishments, even if they reach a different end result than what they planned for at the outset.

“ I feel like now I need to understand stuff, not just learn a bunch of formulas for the test. And Compass puts you in an environment where you have to learn how to think with a science-y brain ”

◆ Leadership



Compass is not a program done to or for students, it is a program of and by students. Undergraduates are not passive participants, but can shape Compass by taking on leadership roles and developing a sense of ownership of and pride in the program. They learn organizational and self-advocacy skills while receiving mentorship and guidance from graduate students. Compass students do more than fill existing leadership roles, they advocate for changes in the program and even develop new components.

When a student in Compass wants to develop something new, they can go out and do it. An undergraduate upper-classman in Compass created a new seminar course to introduce students to fields of contemporary research in physics. This classroom was modeled after existing Compass courses and reflected Compass values. Students feel pride in giving back to a program that benefitted them. This is exemplified by their willingness to take up leadership positions, coordinate the Summer Program, participate in outreach efforts, and other activities.

“ I felt like I was taking my education into my own hands and filling a need that I felt wasn't being addressed. I also demonstrated to myself that I could follow through on things (with support) and make a change. ”

◆ URL

<http://www.berkeleycompassproject.org>

