

Statement of Teaching Philosophy

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“The movement of the swimmer does not resemble that of the wave; in particular, the movements of the swimming instructor which we reproduce on the sand bear no relation to the movements of the wave, which we learn to deal with only by grasping the former in practice. We learn nothing from those who say: ‘Do as I do.’ Our only teachers are those who tell us to ‘do with me,’ and are able to emit signs to be developed in heterogeneity rather than propose gestures for us to reproduce.” – Gilles Deleuze

In the first class I TA’d, an exasperated sophomore approached a senior who was loudly proclaiming a tricky problem to be trivial. She exclaimed, “Have you forgotten what it feels like to learn?!” The comment was poignant to me as a physicist, as our field is rife with treacherous subtleties and technical jargon. Since then, I have strived in my teaching to put difficult concepts into plain words; to render the abstract intuitive and concrete; to strip away the jargon; to teach from the eager beginner’s perspective; and most importantly, to *do* physics together with my students rather than to talk at them. As Shunryū Suzuki says in *Zen Mind*, “In the beginner’s mind there are many possibilities, but in the expert’s there are few.” Too often, the relentless progression of the expert’s lecture, as if set on railroad tracks, bulldozes over the creative connections formed organically by the beginner.

Indeed, what greater joy is there than to experience physics and its discovery with its disciples, and thereby to keep it vibrant and alive? For me it is even an existential matter: I cannot let my science calcify—I must keep it always real, present, close at hand. On a practical level, I teach physics because I see it as a social mission, valuable for everyone, and above all a genuine artistic expression of the human spirit. Through physics we learn not only about the world, but also about world-knowing—about the act and art of doing physics. And in the end, we always find humanity and ourselves at its core.

There is also the administrative aspect of teaching. Here I am acutely aware of the alienating and potentially exclusionary “vertical” power dynamic between a professor and their class. To the extent that being part of such a dynamic allows, I use my station to create a collaborative, inclusive “horizontal” model of learning that centers and empowers the student. From within the liminal space I occupy as a TA, somewhere between the desk and the podium, I aim to blur the boundaries between learning and teaching, and seek to integrate the two. I reject the utility of passive lecturing: instead, I encourage questions and active dialogue during my sections and office hours. In my desire to guide and nurture the creative forces of my students, I tell them that wrong answers can be better than right answers: the former begin discussions, while the latter end them. Knowledge that flows in one-way pipes from professor to pupil is dead upon arrival, while knowledge that circulates freely through the classroom is alive and always reconstituting itself through experience.

My approach to teaching rests on several central tenets. (1) Foster inclusivity, an open community, a friendly atmosphere, and a collaborative spirit. Break down historically oppressive facets of the traditional classroom. (2) Center the students and support cooperative, active learning. Emphasize questions, dialogue, and the agency of the class. Give space to wrong answers and messy discussion. Let students voice their developing understanding to each other and themselves. (3) Treat the classroom as the site of an apprenticeship, and transform lectures into spaces of knowledge creation rather than transmission. (4) Exhibit generosity, compassion, and kindness, and strive to be approachable and accessible. Focus on physics rather than bureaucracy, and root out gatekeeping: physics is already hard enough as it is. (5) Uphold students' self-confidence and sense of tenacity. Repeated failure is necessary in physics, and should not be discouraged. Do not group students by ability; rigor and accessibility are not mutually exclusive. (6) Take a multimodal, integrated approach. Equations, verbal arguments, visual aids like diagrams and graphs, and experimental demonstrations should all come together in presentation. When possible, inject humor into teaching!

Over the past three years, I have taken an energetic, hands-on approach to these ideas in nearly a dozen courses. Outside of my usual TA duties (sections, office hours, grading HW and exams, writing solutions), I have written syllabi and prepared extra material when the professor did not provide them; reached out to students to discuss course material, research opportunities, and postgraduate plans; moderated active Nectir channels; and, especially during COVID lockdowns, communicated students' concerns to professors. Many students have struggled during the pandemic, contending with awkward time zones or unfavorable learning environments. In my role as a liaison between students and the professor, I have worked to accommodate a large variety of circumstances by holding "international" office hours at night, editing exams, and ensuring that classes were administrated equitably and accessibly. Even when I am not TAing, I continue to pursue outreach, mentorship, and open communication in the physics community through my ongoing involvement with Undergraduate Diversity and Inclusion in Physics (UDIP) and the Physics Circus.

I have found it incredibly rewarding to see my students grow, improve, and succeed over the years. Students who I remember struggling in my lower-division courses can nowadays be seen around Broida helping others with advanced topics, providing both support and inspiration. One junior who came to me last year, unsure of whether to stay in physics after a disappointing midterm, was recently raving to me about his first paper. And several students whom I have TA'd and mentored have gone on to prestigious graduate programs.

Physics, like any art, is full of beauty and magic. And as its students—whether formal or unwitting disciples of its teachings—we must rise to the same ideals in teaching: to experience and inspire its beauty, and, yes, to work magic.