

Teaching Statement

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Teaching and mentoring is integral to contributing to the growth of knowledge in the world, alongside research. Hence, teaching is a mission I would like to contribute to in a dedicated manner. As outlined in my C.V (under "Teaching Experience"), I have spent significant time teaching during my PhD years, as a teaching assistant. I have taught both laboratory courses and conducted discussion sessions for undergraduate students. Helping students solve problems they found difficult, or helping them with setting up and analysing the results of an experiment correctly, gave me a lot of satisfaction. I have also helped my teaching supervisors design exams and test quizzes for the courses I taught. At present as a postdoc, I have been mentoring the graduate and undergraduate students in my present research groups and collaborations. These experiences would help me continue to be an engaged teacher and mentor in the future.

I can be involved in classroom teaching at the undergraduate as well as graduate levels. Helping develop course curriculum at these levels would also interest me. I would like to help design course structures, keeping its applicability in research in mind. In my research life, I have been greatly helped by courses that laid the foundations of complex research areas in a simple way. I would like to do the same for the future generations.

My experience of working with large collaborations has given me many opportunities of collaborating with other scientists and also mentoring PhD students, both in my local research group, as well as in the wider collaboration.

I have taken an active role in science outreach and communication, as outlined in my C.V. During my PhD days, as a member of Coffee Shop Astrophysics at UW Milwaukee, I helped organize and give public talks at a local coffee shop. These events were heavily attended by local families with curious school age children as well as undergraduate or graduate level students. During this time I also gave talks aimed at undergraduate physics majors at the campus astro club and the planetarium. During my postdoc at Penn State I helped organize an online gravitational wave summer camp aimed at high school students and helped with the preparation and delivery of the lessons, tutorials and talks. I have also played an active role at conferences in organizing events beneficial to students (for example, a career counseling workshop organized in Aspen winter conference 2022). I would like to carry this forward and also involve students in forming clubs that help with science outreach. Such public outreach efforts can encourage the participation of underrepresented groups in physics.

I was immensely helped by a course I took on teaching physics (Physics 610 - Art and Science of Teaching Physics) during my first year of Phd. This taught me how different students learn differently and how hands-on training can engage students the most in science. I understood the importance of assessing prior knowledge of students with a pre-test (a basic quiz on the 1st day of classes) and designing lessons accordingly. Implementing such techniques in my own teaching, helped my students, as reported by them in the teaching assessments at the end of the semester. I also personally found office hours to be very helpful to certain students who were introverted or otherwise felt underrepresented and struggled to clear their doubts in class. Individual help during office hours which are separate from usual class time, helped a few of my students stay enrolled and eventually do well in the course, which they otherwise found difficult. I have had students who held harmful ideas shaped by society, that I have helped them debunk. I had a female student who thought "men are better at math". After asking her to come to my office hours, I realized she struggled with algebra and trigonometry. After a few weeks of her getting extra help from me during office hours and also visiting the campus tutoring facility, she dropped the idea of dropping out of the class and did well in the course. These experiences taught me that hands-on teaching and individual attention to students, help with physics teaching. Designing courses that help students understand what skills they need to strengthen and providing the resources for doing so are techniques I have found useful

and would incorporate into my teaching.

In general my major teaching philosophy is:

1. To focus on concepts and visual training using internet based learning tools. I believe in using visual active learning (Bonwell & Eison 1991) which is shown to be more effective than just information. I tend to use the teacher-scholar model (Boyer 1990) where students can begin implement their education in investigative, creative and research scenarios;
2. Use of technology and availability of material, to be prepared for online classes. We live in an era of pandemics and uncertainty of in-person presence. Hence developing learning and teaching workflows that can be switched seamlessly between online and offline, would be of priority to me
3. Focusing on student participation, especially encouraging minorities. I would like to help develop curriculums that help students with both research and industrial or technical interests.

REFERENCES

Bonwell, C.; Eison, J. (1991). *Active Learning: Creating Excitement in the Classroom* AEHE-ERIC Higher Education Report No. 1. Washington, D.C.: Jossey-Bass. ISBN 978-1-878380-08-1.

Ernest L. Boyer (1990). *Scholarship Reconsidered: Priorities of the Professoriate*, Princeton University Press, 3175 Princeton Pike, Lawrenceville, NJ 08648.