

Dr. Steven Iona

University of Denver Department of Physics and Astronomy

Rachel Jaeger¹, on behalf of the Editorial Board

¹DUURJ Editor at Large, University of Denver



1 WHAT DID YOU DO BEFORE YOU BECAME A PROFESSOR? WHAT DID YOU STUDY DURING YOUR DOCTORAL PROGRAM?

My college had a program that linked the Department of Mathematics with the School of Education so that I could get two degrees in four years and two summers, and I'd have a teaching credential. I got a job as a math teacher. I was actually a math and science teacher at a middle school, and I did that for a couple of years, and then I got a job as a high school science teacher. I did that for a long time. I had the opportunity to help open a new high school, which was really exciting. Along the way, I was a department chair and did school budgets and data analysis with test scores for the district, and I ran their outdoor education program. I had lots of different jobs with the school district. I didn't know I

would have those opportunities beforehand, but I took advantage of a lot of them.

For my Ph.D., as a high school teacher, I took additional classes—some additional classes were in the sciences, some were in pedagogy, and some were in administration. I had a teaching license and an administrative license, so I could have been a principal. But I gradually acquired a lot of credits and could take a few more classes so I'd have enough coursework to get a doctoral degree. You still have to do some research, so I investigated how students had some physics information organized. I asked them questions and recorded the first things that came to their mind. I was interested in the linkage between the question and this bit of knowledge. By doing some other triangulation—for example, they took a test, they answered some paper questions and some interviews—I could identify how students had physics knowledge organized. So, that's what's wonderful about the university having a teaching professor line. I don't have to have a big lab, graduate students, equipment, and things like that. I can focus on teaching and student learning.

2 DID YOU ALWAYS WANT TO BE A TEACHER?

I had a couple of things that I was interested in. You like things that you're interested in, so you pursue those. Things in science, math, and engineering were among those. I also toyed with some stuff in religion. Seeing an announcement on the bulletin board about a program that I could complete in four years and two summers, and have a job, accelerated that option.

3 HOW HAVE YOU APPROACHED TEACHING GENERAL PHYSICS WHEN IT'S A SUBJECT THAT CAN INTIMIDATE A LOT OF STUDENTS?

Probably by acknowledging that. I tell people that I am so lucky that I have good students, because they're all science students, and they've taken multiple science classes by the time they see me. We start there—

acknowledging that students are smart, they're doing well, they can do physics! If they can do some of these other biology classes that I think are way harder, they can do physics. So there's that kind of positive mindset and approach that I have, and I try to help students see that. Also, they know a lot of this stuff already. They may not have liked it in high school with trig or more algebra or graphs, but there's not a lot that's just brand new. Some of the content, maybe, but the structure is not brand new. We do graphs, we do calculations, we do word problems. I try to build on what students already know how to do. And then for the physics part, because lots of students didn't have physics in high school or didn't like physics in high school, I try to just break it down so that "Hi, you can do this and you'll have success". Then I tweak it a bit, and we'll do the next one. My teaching is a lot of scaffolding, or building. We say, "Alright, this was easy, wasn't it! Now let's do it when there's some initial speed, and now let's make the acceleration negative, and now let's add a force and a different direction." So it's a sequential building, and students nibble away and it's all okay. Suddenly, at a midterm, we think, "Gosh, we did a lot of stuff, didn't we, and it was all okay."

4 WHAT PROGRAMS OR RESEARCH ARE YOU INVOLVED IN OUTSIDE OF TEACHING?

Okay, programs. When I was working in the school district, I did a lot with science fairs. I was director of the Metropolitan Science Fair and that kind of thing. I didn't have that many students that I shepherded through a science fair, but I was the one who directed and hosted the fair. I've continued doing that. I've done Scientific Review Committee for the state Science and Engineering Fair, and I still do that. I have been heavily involved with the American Association of Physics Teachers. I was on their Board of Directors for more than a decade as their secretary, treasurer, and president. I still do things with the physics teachers. While I've been at the university, I've helped sponsor Physics Day at Elych Gardens and taken students down to do demonstrations there. There are other leadership positions that I've been part of, kind of under the broad category of service, both here on campus and with other organizations like the American Institute of Physics. I'm not so involved in research or publishing. Every test that I give, I'm doing some research! More of my time has been spent in organizational and leadership roles.

5 WHAT DO YOU LIKE TO DO OUTSIDE OF YOUR PROFESSIONAL LIFE?

I'm trying to make this sound not boring...I guess it comes under the broad category of problem-solving. It might be with the upstairs toilet, or it might be with

the humidifier in the basement, or other things around the house. So whether you call it tinkering or problem-solving or trying to fix things, that is something that I enjoy doing. Sometimes that means it's a computer program, and sometimes that means it's a physical thing.

6 YOU WILL BE ENJOYING SABBATICAL NEXT QUARTER. WHAT PLANS DO YOU HAVE?

I have a couple of things that I want to write for the physics teacher organization. It's not a position on the board, but I'm their historian, so I've got some history things I want to write. Also, for a long time, I've been interested in helping students pick careers. In the general physics class, most of those people are biology majors, and lots of them have aspirations to be in medical school or PA school or something like that. Like I say, I've got good students and I write a lot of letters of recommendation, but not all of them are going to get into PA or medical school. Not because they aren't good students, but just because. I've worked with different groups on campus to help students try to think about, for example, healthcare, more broadly. It's hard because for lots of students, at four years old, they wanted to be a doctor, and here they are at twenty-four years old and it's not working. So they've kind of narrowed their scope instead of expanding it. In healthcare, for example, there are lots of things that someone who has biology, chemistry, and that kind of coursework could do. They could do pharmaceutical work, they could do imaging, or they could work with medical devices. They can even work in sales. If you know some organic chemistry and some biology, you can talk to a doctor about selling things. So I'm trying to have people broaden some career ideas.

I worked with the alumni group, and we started Mentor For A Moment. It's where we have alumni who are available for discussion with students. They can't offer a job, but they can talk about what they did since they graduated, and that's where you find out about careers that you hadn't thought about. You hear that somebody who, two years ago, was sitting in the same seat you're in now has a job. What I'd like to do is work with the university to identify alumni in the United States in cities like Houston, Seattle, LA, New York, and Chicago. I'd like to expand on this idea of broadening your perspective about jobs. Maybe during spring break, winter break, or the summer, if we can connect students with an alumni in their hometown who's doing something in healthcare, that's another way to start building a network. It's not designed to get an internship or a job, it's just to learn more options. So, that's something I'm trying to promote. We have alumni, we have students—you'd think we can bring these together to give students more options.

**7 WHAT ADVICE DO YOU HAVE FOR
UNIVERSITY STUDENTS, WHETHER THEY
ARE JUST GETTING STARTED WITH THEIR
DEGREE OR CLOSE TO GRADUATION?**

There are two things. One is, when things aren't going so well—whether it's with a class, a friend, some relationship, or political situations—it's worth asking, "What role am I playing in how things aren't going well?" It's easy to blame somebody else or to complain, but what is it that I'm doing or could do differently that could improve this relationship or this situation? And, the other is kind of related. It sounds cruel or corny, but *you are not the most important person*. It's easy to put yourself first: what I need, what I want. Even when you're trying to be empathetic or inclusive...it would be wonderful if you have a good friend who can hold up a mirror and say "Thank you for seeming to care, but it really seems to be about you". Sometimes you need to do that for yourself. You need to do some self-reflection on how things are going and whether you talked too much or made all the decisions. That's not necessarily being a good friend or partner. You know, we can talk about the usual ones—study hard—but those are lessons that I only learned later and the hard way.