

- Evelyn Lamb: [00:00](#) Hello and welcome to the Lathisms Podcast. I'm your host Evelyn Lamb. In each episode we invite Hispanic or Latinx mathematician to share their journey in mathematics. I'm very excited today to be talking with Steven Wirkus. Hi, how are you?
- Steven Wirkus: [00:25](#) Doing okay. How are you?
- Evelyn Lamb: [00:26](#) All right. And can you tell us a little bit about yourself, where you're from, where you teach? Where you are right now, which I gather is different from where you actually teach?
- Steven Wirkus: [00:36](#) Yes, so I'm a professor at Arizona State University. I have been all over the place. I was born and raised in Missouri in Kansas city. I went to grad school in upstate New York at Cornell university. Took a position at Cal Poly Pomona over in the Los Angeles area for seven years.
- Steven Wirkus: [00:57](#) And along the way got married. And so my wife and I... So it's Erica Comacho. We were trying to solve the two body problem, and Arizona state university is the one that allowed us to do that. So before that we were 45 miles apart in terms of our schools, and that made one of us always have an awful commute. So this is much better.
- Steven Wirkus: [01:23](#) In terms of where I'm at right now. So she has a position at the National Science Foundation, and so I am remotely teaching my classes via Zoom this year, which is working out well so far.
- Evelyn Lamb: [01:36](#) Great. And do you remember if you were interested in math when you were a child, or do you know how you got interested in math?
- Steven Wirkus: [01:44](#) So at some point along the way, and I'm not quite sure when, seem to remember is sixth grade, seventh grade, something like that, I started being pretty good at math, picked it up easier than a lot of the others. And it's funny, but the thing that's always motivated me was that I didn't seem to always be the quickest one in the class. I was perpetually second, which is just an odd. Maybe it comes... I'm from a family of seven, and so we just tend to be competitive.
- Evelyn Lamb: [02:17](#) But you had something to strive for?
- Steven Wirkus: [02:20](#) But I had something to strive for, and I was pretty good at it, yes.

- Evelyn Lamb: [02:23](#) And what field of math are you in now?
- Steven Wirkus: [02:27](#) I'm in applied math, and basically study mathematical biology. And so in terms of undergraduate, so I didn't know what I wanted to do when I went to college. I was the first in my family to go to college, and I know I didn't want to check undecided in the box. And it seemed like all of my friends from high school were checking engineering, so didn't want to be one of the crowds. So I chose math, because I was good at it.
- Steven Wirkus: [02:52](#) And then I enjoyed physics when I took that in college, and actually did a double major in math and physics. And it wasn't until my fifth year there, so I was on a five year plan, that I decided or realized that what it really was that I liked was seeing the application of the math. And so that allowed me to then clarify what it was that I wanted to study.
- Steven Wirkus: [03:18](#) And so in graduate school I started off with applications to physics, and then halfway through switched to applications of biology. So my PhD, my dissertation is basically a physics application, and almost all the publications since then have been biology applications.
- Evelyn Lamb: [03:37](#) Okay, so you've been all over the place?
- Steven Wirkus: [03:41](#) Literally many times, yes.
- Evelyn Lamb: [03:43](#) Yeah, and what is the current research that you're doing?
- Steven Wirkus: [03:47](#) So the current research I'm doing is more epidemiological, so looking at populations of things. So I'm working with a couple of students, on one looking at Adderall in the college population. Another one looking at Vicodin abuse or opioid abuse in a more general population. And then also looking at... Part of my research area is looking at photo receptors. And so thinking of that as a population, concentrations of chemicals, and looking at those kinds of things.
- Evelyn Lamb: [04:24](#) Okay, and so these things about Adderall and Vicodin, are those about the population dynamics of how those drugs are distributed? I'm just curious about how that works as a math problem.
- Steven Wirkus: [04:41](#) Yes, so it's not how they're necessarily distributed, although that can be one part of it. But it's more breaking people into classes of people, as in somebody might be exposed to, or susceptible to being a user. You might have other people that

are users because it was something that was prescribed. They might be users because of going to some party, or gathering, or having a friend that uses, whichever one it might be. Having another class of people that might be abusers, and then another class that might be recovered. And so looking at the interaction of those, and realizing that what you want to do is really minimize the amount of people in your abused class. And so trying to figure out what you can change in your system to have that effect.

- Evelyn Lamb: [05:37](#) Interesting. So this is something that seems like really could have a big impact on people?
- Steven Wirkus: [05:43](#) Potentially yes, potentially. The only potential problem is sometimes the thing that's predicted to have the greatest effect, you might have no control over.
- Evelyn Lamb: [05:51](#) Right, yeah. I guess there are a lot of variables working here?
- Steven Wirkus: [05:55](#) Yep.
- Evelyn Lamb: [05:56](#) Backing up a bit, do you remember being encouraged to go into math when you were younger?
- Steven Wirkus: [06:02](#) So I was encouraged to stay in school for sure. And then in undergraduate, it was interestingly enough, an English professor of mine who was the one that encouraged me to think about graduate school. So I had been doing perfectly fine, lots of As, a few Bs in undergrad. And we were having a conversation, and she told me, "Have you thought about graduate school?" And I had to ask her what's graduate school. And so she was the one who then explained to me, "You know you can get paid to continue studying," which sounded like a terrific idea to me. So I stuck with math and studied.
- Evelyn Lamb: [06:45](#) And so she wasn't necessarily expecting you to go to graduate school in English? Just somewhere?
- Steven Wirkus: [06:51](#) Oh, not at all. So when I started undergraduate, I had to fear that I was going to fail out. And so I figured I was going to fail out with a good reason. And so I joined the honors program. And so she was one of the directors of the honors program. So as it turned out, I didn't fail out. I did rather well, but she was the one that pointed me in the right direction at a few key points in life.

- Evelyn Lamb: [07:17](#) And what was the transition like between undergraduate and graduate school?
- Steven Wirkus: [07:23](#) It was one of the probably two or three most difficult transitions in life. So I remember in undergraduate, the normal course load is five courses. And then being told the week before classes start in graduate school that three is a normal amount, and thinking to myself, "Oh that'll be easy. Let me just do four instead." And so that was a mistake that I didn't make again. So graduate school is the fire hose analogy, where you can spend as much time as you can, and it's still never enough time.
- Evelyn Lamb: [07:59](#) Right, I was just editing an earlier episode and someone used that exact same drinking out of the fire hose thing. So did you have mentors when you were in graduate school that helped you find your way through the fire hose?
- Steven Wirkus: [08:17](#) So yes. And it wasn't always in the places that you would expect. So there were mentors that weren't necessarily my teachers in class, although there were a couple that I would go to for advice on things. I was part of a, back in a different life, I used to run a lot. And so some of my running friends who were also professors would sometimes give us advice. And they had nothing to do with math, or encourage me to go into their area or anything. And so just the advice you get from experienced people that even aren't necessarily in your area, that seems to be where I got a lot of my advice and mentoring from.
- Evelyn Lamb: [09:04](#) And now that you're further along in your career, what are some of the things that maybe you feel like have helped you develop professionally as you move along?
- Steven Wirkus: [09:15](#) I've always viewed myself as somebody who works hard, but I don't know that I've often had a clear mindset or clear goal in terms of this is exactly what I want to do. And so what that has allowed me to do is more easier roll with things that might come up. And so I think having some flexibility, realizing that maybe plans that you had might not be the best ones, but there might be a perfectly good alternative that's not too much of a step away from what your original plan were. And so I feel like at many points in time plans that I may have had went awry, but if I was willing to try the backup, the backup actually worked out much better than my original plan.
- Evelyn Lamb: [10:19](#) And I guess that leads into my next question, which is about overcoming challenges in your career. And do you mind talking

about some of the challenges that you faced, and how you've managed to get past them?

Steven Wirkus: [10:36](#) And so I think some of the challenges, the biggest ones were probably academic in nature, well at least initially. And it was realizing that hard work definitely was one of those things, but an acceptance of that you might fail, you might, and it might not be good enough. In some sense, calm the nerves enough to maybe let the hard work take over a little bit more.

Steven Wirkus: [11:10](#) And then also hearing from mentors, whether in the field, or peers that even were a year or two ahead, that gave you the advice of, "You know what, that class kicked everybody's butt. Don't worry about it." Which didn't mean stop trying. It just means that that maybe you can try all you want, and it won't make a difference, or maybe it will. But having the peace of mind that things will work out even if not maybe in the way you intended.

Steven Wirkus: [11:44](#) And then every so often just putting things in perspective of I never really thought or felt that I had the pressure to achieve even in graduate school up to that level, and being thankful for where I was. And then that also I felt like it took a little bit of pressure off. And now that I'm saying this, it seems like a lot of the challenges, maybe a half of them are probably pressure related. And so if you can learn to calm your nerves better, and proceed or succeed, and try with a clear mind, that can go a long ways.

Evelyn Lamb: [12:32](#) And I'd imagine at this point in your career you're also doing a lot of advising and mentoring. And yeah, what are some things that you try to think about when you're advising students?

Steven Wirkus: [12:52](#) So in terms of advising the students, I think it's a couple of things. So first one is it's whatever decision they end up making, it's never too late to change it. And so this is motivated by my first couple of days of undergraduate, and that I went to a campus that was mostly a commuter campus. So it was University of Missouri at Kansas City. And in my very first class there was a 65 year old lady who just was taking classes because she wanted to. And in most of my math classes, at least a third of the class were 40 and over students who were returning to get their degree.

Steven Wirkus: [13:37](#) And so this had two effects. One of realizing that yes I have that option to let's say drop out and come back later. But I might as well take advantage of it now because there's no family

commitments or anything else. And so I should just buckle down and do it now. But that also the advice that I can give my students now is it's better if you can buckle down now and take care of it. But don't think because you might choose one thing now, that in three years you can't change your mind.

- Steven Wirkus: [14:12](#) And so having them realize that it's not that often that life is a single track that you can't ever get off of, that you can always backtrack, or change, or alter. It might take more work. It might take more time. It might take more money, more sacrifice, but nothing is ever final.
- Evelyn Lamb: [14:39](#) Now can you go back and tell me that for when I was 25?
- Steven Wirkus: [14:46](#) Well so it's a question of, I don't know if I could have told myself that at 25, because I probably wouldn't have listened. And so it's telling the students hoping that 20% of what I say will sink in.
- Evelyn Lamb: [14:57](#) Yeah. Well we always have great advice for our past selves. But yeah, that's such an important thing to be able to do, is to know that you aren't stuck on whatever track you're on right now.
- Steven Wirkus: [15:16](#) That's right. That's right. It might be difficult, but you're not stuck.
- Evelyn Lamb: [15:20](#) And we're recording this on October 15th, which is the last day of Hispanic Heritage Month. Do you have any thoughts about Hispanic Heritage Month?
- Steven Wirkus: [15:31](#) Probably about the middle of graduate school I started working with a summer research program for undergraduates, and it was mostly Latinos and a handful of Native Americans. And I've worked with similar type programs, co-ran, co-started actually one as well. And so what I've come to realize through experience over the years is how crucial it is for a decent number of people to have role models that they can actually identify with. And it doesn't have to be necessarily somebody that looks like them, but it has to be somebody that there are similarities with them.
- Steven Wirkus: [16:29](#) That being said, I think the easiest one is when you at least at initial have somebody that you can look up to, because you can see yourself in that person. And so having Hispanic Heritage Month I think is an excellent way of highlighting the wonderful work that a lot of Latinos have done, because I think a lot of it has been undervalued simply because of the way historically

society has liked to keep things in the way they always have been. Even though demographics may be changing, ways that we realize we should be teaching might be changing, not everybody thinks that everything should be reconsidered, or that many things should be rethought in terms of how we best do things or approach things.

Steven Wirkus: [17:35](#) And so I think Hispanic Heritage Month is one way to help shift this, and shift this discussion so that obviously we Latinos realize there's a lot of us that are pretty talented. But I think go a wider range of people might not necessarily think that simply because of media stereotypes and everything else. And so I think it's a terrific idea.

Evelyn Lamb: [18:03](#) Well, thanks a lot for taking the time to talk with me today.

Steven Wirkus: [18:06](#) Thank you very much for having me.

Evelyn Lamb: [18:10](#) Thank you for listening to the Lathisms Podcast. It's produced by me Evelyn Lamb, and made possible by a Tensor-SUMMA grant from the Mathematical Association of America. Our music is Volveré by La Floresta.

Evelyn Lamb: [18:23](#) Lathisms is an initiative to celebrate the accomplishments of Hispanic and Latinxs mathematicians. It was founded in 2016 by Alexander Diaz-Lopez, Pamela Harris, Alicia Prieto-Langarica, and Gabriel Sosa. You can find more information about the project at [Lathisms.org](http://Lathisms.org). That's L-A-T-H-I-S-M-S.org. Join us next time to hear from another inspiring mathematician.