



Evelyn Lamb Interview

Conducted by Alexander Diaz-Lopez



Evelyn J. Lamb is a full-time freelance math and science writer. She has a *Scientific American* blog “Roots of Unity” and writes for the AMS “Blog on Math Blogs.” Lamb obtained her PhD in Teichmüller theory from Rice University. To subscribe to her writings, you can visit tinyletter.com/evelynjlamb.

Diaz-Lopez: *When did you know you wanted to be a mathematician?*

Lamb: I did well in math classes going through school, and I even did (and enjoyed) MathCounts in middle school, but math never really grabbed me. I thought of math as rote and computational. You memorize a formula, plug in the numbers, and chug through to get the right answer. MathCounts wasn't really like that, but I didn't see a connection between the fun puzzles we did there and the math from my math classes.

I had the advantage of going to the Texas Academy of Math and Science (TAMS) for my last two years of high school. It's a residential program on the University of

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North Texas campus, so I graduated from high school with about seventy hours of college credit. That gave me the flexibility to meander in college and still be able to graduate in four years.

I went to Baylor University wanting a career as a researcher in nutrition or pharmacology, and I also loved music and had a viola performance scholarship. I technically entered college as a biochemistry and church music double major, although I pretty quickly decided the church music program there wasn't a good fit for me. After a couple years of slogging through organic chemistry and biochemistry classes, I realized that wasn't right for me either. Thanks to my TAMS credits, I was only a few classes away from a math minor. I figured that wouldn't be a bad thing to complete no matter what my major ended up being. I liked my linear algebra class, but what really converted me was an introduction to proofs class I took in the fall of my junior year. It completely changed the way I thought about math. Looking back, I'm tempted to say that two weeks into this one math class, my future was decided, but in reality, there was a lot more back and forth about what I wanted to do because I was also so involved in music. At that point, I played viola and carillon (the giant clock tower bell instrument), I was a soprano section leader in a local church choir, and I absolutely loved my music theory classes. But I was concerned that I didn't really want to practice enough to make it as a professional performer, wasn't interested in teaching private lessons, and didn't have much faith in my employability as a music theorist. I had a lot more confidence in my employability with a math degree, so that's what I did.

Diaz-Lopez: *Who encouraged or inspired you?*

Lamb: My family has always been very encouraging of all my endeavors, whether it was science (my first career goal was to be a herpetologist because I loved snakes), music, sewing, or anything else that caught my fancy. I was lucky to be born into a geeky family, and even though I had those teenage years of feeling like nobody understood me, in reality I've been fortunate at every stage in my life to have wonderful friends who love me for, not in spite of, my geekiness. I'm not going to name individual friends or family members because there are too many to mention!

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I had a lot of good teachers in pretty much every subject who encouraged me throughout my schooling. Mathematically, three of my Baylor professors really went out of their way to support me once I decided to do math. Brian Raines, David Ryden, and Paul Hagelstein wrote my graduate school recommendation letters and spent a lot of time listening to me think out loud about what direction I wanted to go in my career, how I should prepare for graduate school, and where I should apply. I didn't always take their advice, but it was important that they were so encouraging of me.

For writing, my mentor at *Scientific American*, Robin Lloyd, was just the person I needed to start my career. She helped and continues to help me be a better science writer. Julie Rehmeyer is another science writer with a math background who has been both an inspiration and an encourager. You should get her to do one of these interviews!

My spouse Jon Chaika is now my biggest fan and supporter. I bounce a lot of ideas off of him, and when I'm nervous about something I'm trying, he's great at listening to my concerns, talking through problems with me, and encouraging me to try new things.

Diaz-Lopez: *You finished your PhD, then worked in academia, and now you are a full-time freelance writer. What motivated you to make these career choices?*

Lamb: In 2012, right after I got my PhD, I had the opportunity to work for *Scientific American* through an AMS-AAAS Mass Media Fellowship. The AAAS [American Association for the Advancement of Science] runs this program, in which graduate students in the sciences work at various media outlets for the summer, and the AMS sponsors one of the fellowships every year. I had heard about the program for a few years and always thought it would be fun to see how people wrote about math and science for a general audience.

The [AMS-AAAS Mass Media] fellowship was a revelation. Graduate school had really been tough for me, and I kind of felt like I was the person in the world who was the absolute worst at math. I was the infimum! Working at *Scientific American* helped me gain confidence, not because I figured out that there were people in the world worse than I was at math, but because I realized I had something to offer with my mathematical background, creativity, and communication skills. During the fellowship, I wrote about math in addition to physics, biology, chemistry, engineering, materials science, and health. Lloyd and the other editors I worked with were incredibly generous with their time, feedback, and encouragement. At the end of the summer I really felt like I could do this as a career. Before the fellowship, I had no idea how big the science writing world was and that there was room in it for someone like me.

But I had a job lined up already. My spouse got a tenure-track job at the University of Utah, and they had thrown a postdoc for me into the deal. (That's selling myself a bit short. I had been on their short list for a postdoc a year or two prior, and it was a good fit for my research area.) We got the job offers in the spring of 2012, before I did

the fellowship at *Scientific American*, but we wouldn't be starting until fall 2013 so he could finish his postdoc. In the intervening year, I did some freelance math writing for *Scientific American* and a few other places and started my *Scientific American* blog "Roots of Unity." I decided that I wanted to give the postdoc a try and do some blogging and writing on the side.

I loved my students and colleagues at the U, but in the end I felt like I wasn't able to do what I wanted to with my writing because of the energy I was spending on teaching and research. I was having some success and getting positive feedback about my writing, and it was more fun and fulfilling for me than my other work, so I made the emotionally fraught decision to leave academia and do freelance writing full-time. I felt awful and like a failure for a long time while I was making the decision, but the relief I felt when I finally decided and told my chair about it made me pretty confident that it was the right call. So far, I'd say it was. I'm still at the beginning of this career, though. Ask me again in five to ten years.

Diaz-Lopez: *How would you describe your current work?*

Lamb: I'm a freelance math and science writer, which means I'm both self-employed and work for many employers. Currently my ongoing gigs are my *Scientific American* blog "Roots of Unity" and the "Blog on Math Blogs" for the AMS, which I co-write with Duquesne University mathematician Anna Haensch. I've also written for other media outlets, including *Slate*, *Nautilus*, *Smithsonian Magazine*, *Nature News*, *New Scientist*, *Undark*, and the *Association for Women in Mathematics Newsletter*. This year I've been experimenting with an email newsletter for people who want to keep up with my writing.¹

[My *Scientific American* blog] "Roots of Unity" is kind of my playground. I can write about whatever I want in whatever way I want. That's where I can experiment with what topics and type of writing work well and make me feel satisfied. I can make goofy math quizzes or write



Figure 1. An interesting octagonal tiling in Sankt Goar, Germany, that inspired a stream-of-consciousness post on my *Scientific American* blog, "Roots of Unity."²

¹tinyletter.com/evelynjlamb

²blogs.scientificamerican.com/roots-of-unity/math-under-my-feet/

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about the intersection of politics and mathematicians or share my stream of consciousness thoughts about an interesting tiling I saw on the ground [see accompanying sidewalk tiling image]. The [AMS] “Blog on Math Blogs” is about sharing good blog and online math content that will be of interest to AMS members. In other publications, I tend to write more journalistically, though sometimes I write opinion pieces for them as well. Each outlet has a little bit of a different voice and focus, and it’s fun (though also time-consuming and sometimes frustrating) to try to figure out the best places for different story ideas. Recently, I’ve written some articles for middle- and high-school students in *Science News for Students* and *Muse Magazine*. Writing for that age is a fun new challenge, and I’m excited to think that my stories might connect kids with parts of math they don’t always see in the classroom.

University of Florida math professor Kevin Knudson and I recently launched a math podcast called “My Favorite Theorem.” As the name implies, in each episode we talk to a mathematician about their favorite theorem. You should be able to subscribe on your favorite podcast delivery service.

I have some ideas for larger projects and books. I’m currently trying to figure out how to bring those into the world. Stay tuned!

In all of my work, I want to help people have positive experiences with math. That takes a lot of forms for me. Yes, it’s about new research and fun ideas in math, Pi Day, and weird applications of math, but it’s also about mathematicians. I want people to see that lots of kinds of people become mathematicians. That includes diversity in gender, race, and national origin, as well as a broad range of mathematical histories. Some people knew they loved math from a young age, but I think more mathematicians than most people realize came to math a little later, like I did. If people can see that there’s more than one way to be a mathematician, maybe more of them will feel they can understand and appreciate mathematical concepts.

That’s the big pie-in-the-sky idea of my work. On the ground level, I’ve learned a lot in the past few years about the nuts and bolts of freelancing and being self-employed. I’m getting better at keeping records for taxes. I’m getting better at invoicing on time and asking for more money or a better contract with a new publication. I’m getting better — a little, maybe — at accepting criticism and rejection.

It’s hard to make a living as a freelance writer. It takes time to figure out what you’re doing, build a client base, and get enough well-paying work to make ends meet. Even if you’re doing enough work, the paychecks can come sporadically, and you’re an independent contractor, so you don’t get benefits. I’m fortunate that I can get health insurance through my spouse’s employer. I probably couldn’t have taken the chance on freelancing if that hadn’t been the case.

Diaz-Lopez: *What message would you give to those doctoral students and professional mathematicians thinking about a career outside academia?*

Lamb: Having a career outside of academia is not failing or wasting your degree. It took me longer than it should

have to decide to leave academia because I felt like I was throwing my PhD away (even though my job is directly related to my PhD!) or disappointing...my advisor? my parents? my spouse? They don’t seem too disappointed.

For me, I think another aspect was that I felt pressure as a Woman in Math to have some fancy R1 tenure-track job or else I would be Letting All Women Down. That’s not a recipe for a successful career or a satisfying life. I think there is a stigma still about leaving academia, but sometimes a lot of it can come from within. “My advisor will be so disappointed in me.” No. Your advisor should be a human who cares about you as a human. They should want you to have a post-PhD life that satisfies you. If they don’t, that means they’re messing up this part of being an advisor not that you are doing something wrong by leaving academia.

With the academic job market as it is right now, mathematicians should be actively combatting the non-academic employment stigma because we do produce more PhDs than we have room for in academic jobs. We need to be setting students up to be successful in a variety of careers.

One of the most important things Robin Lloyd said to me was during a conversation maybe a month into my fellowship about my future career plans. I mentioned that I had a postdoc lined up but didn’t know if I had what it takes to be a researcher and an academic but felt like science writing would be a good fallback. She told me that I shouldn’t pursue this career because I was feeling unsuccessful in math. I should pursue this career because I would find it fulfilling and could be successful at it. In retrospect, my comment was both absurd and offensive. Science writing is a competitive field, not a backup option if you don’t get a teaching job. Believing that an academic career was the only way to be a successful mathematician was a big part of the reason I thought that way. Non-academic jobs are not consolation prizes.

Diaz-Lopez: *What advice do you have for graduate students?*

Lamb: I should have gotten more help earlier than I did in graduate school. I needed mental health help and help learning how to learn mathematics. I was a pretty cocky student up through college. Math, and most subjects, came easily to me, and when I got to grad school I thought the fact that I was suddenly struggling meant I was a fraud. I was afraid of looking like I didn’t know something, so I faked my way through things, nodded without understanding things, and spun my wheels a lot more than I needed to. There are mental health resources on campus, and your professors and fellow graduate students want to help you understand things. Tell them when you don’t understand.

As for getting jobs outside of academia, don’t waste too much time asking your advisor about this. Your advisor stayed in academia and might only have a vague idea of what other jobs are out there. But there are ways to learn about what’s available and how to get those jobs. Reach out to former students from your school or other mathematicians who have gone into those jobs. I wrote a blog post recently for the AMS called “What are you going

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to do with that?"³ about resources for non-academic job searches.

Diaz-Lopez: *All mathematicians feel discouraged occasionally. How do you deal with discouragement?*

Lamb: When I can afford the time, I will step away for a while from projects that are discouraging or frustrating me. Sometimes I'll work on something else for my job, and sometimes I'll take a break from work altogether. For me, I think a lot of work gets done subconsciously, or when I'm taking a walk, cooking dinner, playing music, or pulling some weeds. Rolling ideas around in my head for a while can help me with writer's block or dissatisfaction with what I'm working on. It's really helpful to come back to something with a fresh eye. The article that's been bugging me is often better than I remembered it, and my time away can be especially helpful for solving organizational problems in my writing. A break is also a good way to remember I am a complex, multifaceted human who eats and reads and sings and enjoys nature. We are more than our work, and I think that's an important thing to remember.

Diaz-Lopez: *If you were not a mathematician, what would you be?*

Lamb: Who knows?! I have a lot of different interests, and I can imagine myself in a lot of different careers. In addition to music, I was very close to going into ordained

ministry when I was in college, but I no longer feel pulled in that direction.

One of my hobbies is sewing, and sometimes I imagine quitting my job and going to school to become a fashion designer. Sewing and design are mathematically satisfying activities. You get to think about orientation, curvature, and singularities, but in the end, instead of a bunch of theorems written on paper, you might have a dress! So yeah, let's go with fashion designer.

Diaz-Lopez: *If you could recommend one lecture or paper to graduate students, what would it be?*

Lamb: The lectures and papers that come to mind as formative for me seem a little too specific to my former field of research, Teichmüller theory, to recommend them to graduate students in general. Instead, they (and other mathematicians) should read Erica Walker's book *Beyond Banneker: Black Mathematicians and the Paths to Excellence*. All mathematicians should know more about the history of African Americans in math. White mathematicians in particular should know about past and present examples of Black mathematical excellence and understand some of the obstacles their Black classmates, colleagues, and students may be facing and what we can do to make the mathematical community better for them.

Diaz-Lopez: *Any final comment or advice?*

Lamb: Mathematicians and math enthusiasts are understandably eager to promote math. But sometimes we alienate people rather than welcome them. We can sometimes create an exclusive, in-crowd atmosphere when we throw around jargon and assume everyone is going to know what we're talking about. Not knowing something about math is not an indication that someone isn't smart or couldn't do math. We need to do a better job inviting more people in when we're expressing our excitement rather than making people feel like they're on the outside and will never understand it. Math anxiety and trauma from past math classes are unfortunately quite common. People don't need much of an excuse to tune out when you start talking about math. Don't give them one by being condescending or exclusionary.

Image Credits

Photo of Evelyn Lamb by Jon Chaika.

Figure 1 by Evelyn Lamb.

Figure 2 by Jon Chaika and Evelyn Lamb, created with Malin Christersson's hyperbolic tiling tool.



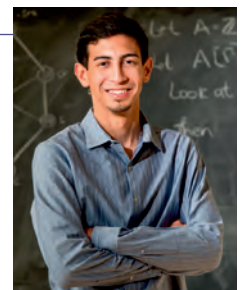
Figure 2. Everything looks better in the hyperbolic plane! I used this picture from a trip to the Firth of Forth in Scotland to tile the hyperbolic plane using Malin Christersson's hyperbolic tiling tool.⁴ If you look closely, you can figure out what kind of polygons I used and how many meet around each vertex.

³blogs.ams.org/blogonmathblogs/2017/05/15/what-are-you-going-to-do-with-that/

⁴www.malinc.se/m/ImageTiling.php

ABOUT THE INTERVIEWER

Alexander Diaz-Lopez, having earned his PhD at the University of Notre Dame, is now assistant professor at Villanova University. Diaz-Lopez was the first graduate student member of the *Notices* Editorial Board.



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