1 Weverton: Okay, so how they see your name? Jennif?

2 Jennifer: um, Jennifer.

3 Weverton: Jennife

4 Jennifer: Yes.

5 Weverton: Did I get it right? Okay, So My first question for you, It's a very broad question.

6 Jennifer: All right.

7 Weverton: And, and you can tell me, whatever you want about it, like the whole story about it, how it happened when it started. So it's pretty much I want to know, what motivated you to pursue a PhD in mathematics?

8 Jennifer: For me, it was, I always wanted to, I kind of knew that I any, like topic that I would choose to study ever since I was young, I was going to pursue it until the very end and become a specialized as possible. I think it's because my, both my parents have PhDs. So For me, it was more like just a natural thing to do. And mathematics, it was, I chose my undergrad area, pretty much my junior year of high school. So it was more a matter of just deciding which area of mathematics to stick to, and then I knew I was gonna kind of just finish up until the highest level that I could. So Yeah, I think it was more a matter of finishing every single, You know, level that I could, And any area that I wanted to pursue, And then I later in undergrad, I chose my specific area. So then it became, you know, a matter of just deciding which University was the most suitable, which program I thought would give me what I was looking for, in a, you know, from a graduate education and the, you know, the preparation that I wanted from it. So In my case, I don't think I gave it too much thought it was more like anything I go into, Even though it was, you know, engineering or anything, so I wanted to be a vet when I was younger. I was like, I'm just gonna go down the hallway.

9 Weverton: So you talked a little bit about maybe parents's motivation.

10 Jennifer: Yeah, I think it was a lot of friends. Just you know, they both did that. They had a great experience.

11 Weverton: Was there like an specific area They were doing it like.

12 Jennifer: yeah, they're entomologists. So It's like [inaudible]

13 Weverton: all right. So can you tell me like you, You talked a little bit about junior high school, like some things happening junior high school, so like, why specifically mathematics? Like, Was this something that was happening, that felt like, Oh, I like math or like, what specifically happened, it was like, okay, mathematics.

14 Jennifer: Okay. For me, it was trying to invest in something that would be a challange a lifelong challenge. When I was in high school, I was very much into writing and reading and literature, and stuff like that. And those are my favorite topics, but I never really saw the challenge of them was like, I love reading amazing authors, I admire them, I don't know how they could come up with such amazing books, and you know, their writing styles, but it was always about for me, it was what can sustain me what can be something so challenging, that I will always be running towards, and it will always be, you know, slightly out of reach. And I was not good at math. It was my school did not have a science emphasis. So it was very, like, liberal arts based, kind of all girls high school. So I had a completely different focus. And I read a book that was like mathematics for non mathematicians, I kind of like opened this, like crazy world that I, you know, you did not know that it was even a thing. So I was like, Okay, this sounds really interesting. And It seemed, you know, it wasn't realized, you know, I set my heart to it, I will pursue it until I finish it, and up until I understand what I want to get out of it. And trying to make, you know, my life around it. And I think, it also, you know, it gives you a structure, for me it was about a structure, searching for something that would mold me as a person, as a human being and I think mathematics just has

that. I know a lot of mathematicians are really disorganized, but there is order, you know, in that chaos, there is, it grounds me, to me, it grounds me, it kind of, It always gives you a very fundamental reason, at least to me to go on, like you're pursuing a higher purpose, so, and that sounds, that's what happened for me was like a click. It was okay, I'm not really good at it. But I know that if I do it enough, Eventually I become good, right? I mean, you do something enough. And something will happen. So and then later, I had to adapt. Because I was obviously aiming for areas and mathematics that I was absolutely not, you know, I just didn't think that way. And that kind of hit me pretty early on that a lot of people that went into mathematics, they had just plain raw talent. And it was very intimidating. When I was very, like, you know, just starting I you just see all these people kids that they see one thing for the first time and they are like okay, it makes sense to me, Nothing made sense to me. There was not that, you know, kind of innate, like, my brain did not just think that way. So later became a matter of finding where I could actually contribute to the field, and trying to find a balance between what I can do, you know, And what I can actually learn, I honestly think that some areas of mathematics just because due to to how many how long it's taken to develop them. You would need maybe 20 years to be at the level that you know, some people achieve in seven, Just because their brains just go so much faster, and they just think in a different way. So I kind of redirected myself to applied mathematics, where I could, To me It made sense. Like, applied math to me it makes sense, all the other was, I was like, watching this, like, beautiful, you know, show behind a wall that you just could not, you know, like, like glass, and you couldn't, You could see that it was beautiful and complicated, but you couldn't actually, you know, it didn't completely make sense to you, I did not like feel part of pure mathematics completely, It was really hard for me to immerse myself in that world. And I think as, when I use applied math, I touch you know, it touches. Of course, it's like a very close communication with in the fields, there's no apply to appear. And I think that kind of satisfied the balance between what I can do. And the curiosity of just being in contact with something with a more complicated, you know, more evolved parts of mathematics.

15 Weverton: That's awesome. So can you tell me about the strongest feeling you have experienced as a mathematics student? I would like to hear what that feeling was about what was going on when it happened?

16 Jennifer: I think for me it was finally understanding a topic that in my case, was measure theory and took me a long time to like, actually understand it. I think one of the most exciting feelings was when I finally connected it with probability. And then it was like clicking a light switch. everything made sense. So it was like, I've been studying all these concepts that also did not make any sense to me, the examples that they were giving me were not useful. It was very abstract, it just did not make any sense. It's like, hey, why did anyone come up with this? have any reason to be And then When I saw it applied to probability, you know, it's like, you see this huge structure? And you're wondering, why would anyone build that? Why would anyone painstakingly build this massive, you know, thing when it had no heads or tails for me, And then when you stop when I learned it under the light of probability, it was like, of course, like, there is no way to understand the roll of the dice. If You don't think in terms of you know, measurable spaces, and whatever. So for me, that was an amazing feeling. Because it was from one day to the next pretty much like I started solving some problems in like probability problems. And when I was using the concepts from measure theory, that I needed the theorems, I was like, Oh, my God, like this is, This is why this is why this whole thing was, was made. So it was my realization, that was the best feeling. Understanding a deeper reason. Because you can, you can memorize all the theorems you want, you can, solve all the problems you want, if you know enough of the theorems and you remember enough of the, you know, stuffing class, By connecting with a reason why somebody created those concepts, which is like, I think what we should all aspire as mathematicians to understand, like, somebody came up with it, you know why they should you just don't, you know, pull things out of you. Just because you can well some of them do, but I mean, like, there is a reason why those fields started, right. And I think that was beautiful. I wish I had taken in our history of mathematics to kind of know, Oh, algebra was born Because of this, and not something that would bring you back to you know, the Egyptians because they want to build the pyramids. Something a little bit more modern, like, okay, we created fields, we created groups, we created thois because we were stuck with this. And like, with every field the same

way. So that was the most exhilarating feeling to me.

17 Weverton: And When did that happen? Exactly.

18 Jennifer: It was like my second year in grad school. So I was passing quals. So I had to kind of studies topics, which I kind of still use, I saw coming to very close contact with them, and I use the concepts, but it's a completely different, you know, I'm in applied. So it's a, you take it from a different perspective. You don't you don't go as you need them. You don't need to dive that deep in. And I think that's why those fundamental classes are useful. Of course, it depends on you know, how many fundamental classes you've taken? What areas for example, Algebra, I mean, no, It must have been just as beautiful. I hated the entire process didn't make any sense to me. So I couldn't enjoy it, You know, what I entered meta theory, that sudden realization and connection with why, you know, the whole thing was happening with a different field, a different area was like, Okay, this, I just have to pass the requirement of getting over this. That's it, I don't want to see that the rest of my life. So

19 Weverton: so how is the trajectory? Is it like undergrad, and then master's degree, and then a PhD, how did that happened to you?

20 Jennifer: I did not do a Masters, I kind of wish I had, I feel like I would have had a much solid, like a better, more solid foundation and a bunch of different areas had I got a Master's. But the problem is that here in the States, it's very discouraged. For people that are going into research and I don't understand why like I honestly like up to this day, I have never seen anyone be hindered by that. I just feel that some professors have these thoughts, and they try to get students to do certain things. You know, pretty much pretty baseless. I mean, I was told to not do a Master's, it looks terrible on your CV, you have to go straight to grad school, you pass syou duties, you go to the, you know, best grad school, you can go to and that's it. I did, like kind of went against their advice when it came to taking a gap year. Everyone's telling me not to, like I was gonna just ruin my recommendations or whatever. And I was like, you know, I just do not feel that for me. Like, I just kind of put my foot down on that one. And I was like, I don't care. Like if you think I am ruining my life, I'm still taking a gap year between undergrad and grad school. I just don't feel ready. And I did some research work as a research assistant during that year that I was, that was oferred, I feel that a kind of gave me like a more broad perspective of what I liked and what I did not like to do. So that was helpful. But as I mentioned, the professors, which is like do not do a masters.

21 Weverton: So these people who were teling you like to do not do it? Is it like undergrad professors? Is that right?

22 Jennifer: Well, they're really the, you know, Chair, undergrad chairs or the advisor, because the undergrad chair would typically advise us. And he was, Yeah, I mean, I don't understand why he would advise that to kids, I don't know what experience he had heard by our mentors are very important when they're very big players in our lives. So at least like in mind, Just because my parents were always like, you need to anchor yourself to these people, you know, you need to follow. And they had a really close relationship with their advisors, and they still collaborate how like a very close, you know, lifelong relationship with their advisors. And so I think I placed a lot of stock on, you know, what, what my elders and mentors were saying. Now, I'm a little bit more independent, I have learned that sometimes your mentors do not have your best interests at heart, and they don't do it, because they're bad people, they've just had different experiences. But then you end up paying the price of any decision that you made, even if it was, you know, So I do think, yeah, I wonder if it's a PhD and skip the masters.

23 Weverton: And Can you recall the last time you talked to someone about being a PhD student in mathematics?

24 Jennifer : Um, I honestly think it probably was like, some uber driver, and not really long trip. Probably, I don't really know anyone. I don't get to interact a lot with people inside of the math department. Just because you know, we don't have classes. You don't run into anyone. And you

live in a really, really small circle of people. But yeah, probably an Uber driver.

25 Weverton: Do you remember things that you said?

26 Jennifer: umm, yes, just like, you know because everyone goes like the the script goes kind of like, oh what do you do? I'm like I am doing a PhD in Mathematics, oh, my God, I'm terrible in math, I was like, Yeah, me too. I was really bad. Taken six years to kind of get a little bit better but That's why I'm doing a PhD. If I knew it, I wouldn't be doing it right. I am not that good. And, yeah, probably switch to something else.

27 Weverton: So If you meet up with a student was thinking about taking a PhD in math, what advice for experience could you share to help them make up their mind?

28 Jennifer: The main thing, I would advise is to do an undergrad research project. If a student does not know what research is, or has never done research, I would, you know, recommend them to do it or have some sort of research experience before they make up their minds. And The reason is, because a lot of kids that are brilliant students make terrible researchers, and grad school supposed to make researchers. That's what the whole purpose of it is, right? You're not entertaining a kid here for like, five or six years. So they go and you know, just, you know, I mean, I know some Do, you know, never use it again. It's a huge investment of a person's time. And I know, you know, you can be like, okay, I'm just going to do it as a hobby. Well, you know, there's a, You're taking a spot that ideal, you know, it was designed to breed researchers. So Yeah, that's what I would advise I would be Like, if you don't like research, if you are not able to sit on your own and come up with, you know, even a tiny, original idea. And If you cannot envision yourself as somebody that's going to have to like pull things out of a hat. And be very independent at some point in your life, you know, not not at the end of grad school for sure. But um, maybe later, You know, I would not advise them to go into grad school, or, you know, people that say, I love teaching, you know, go to a master's program go to like math, Ed, or do not, you know, and that's one thing that really irks me, about kids that you run into love kids are like, I was like, you know, straight As perfect. Like, I understood everything in undergrad, no idea what research is. They go to grad school because they love math. Right? That's not why you go to grad school.

29 Weverton: So can you tell me a little bit, a little bit more about what does doing research mean to you? Like? What are your ideas of our own near like, how those good students cannot become good research, like, what exactly that mean?

30 Jennifer: what I was seeing is that these kids, some kids are brilliant, one of my very close friends, you know, like I've had, I've had the opportunity to see him develop through these like, you know, five or six years, they can see that their minds are amazing at solving problems. So The theory is all of their, They have that kind of innate ability almost to put the pieces together of nothing. The difference between a problem solver and researcher is the ability to post questions, so a researcher has to ask questions, that he may he or she may not know how to solve them. But If you ask a really good question, eventually. And if you take a Lino Take care to like try to answer it as best you can. You're going to, you know, you're going to hit, eventually, you're going to hit like the right the right area or the right question. The issue with these kids is that they don't ask questions. There are no questions that are that they're able to formulate. And sometimes it doesn't even come from a math creativity, because clearly they have the creativity to answer the questions. It's more I don't know almost like from I think even someone from a high from a different area or from like, seeing it from like a more removed position in mathematics may be able to ask questions, you know, even if they don't know the topic, And sometimes people that do know, the topic very well just cannot come up with them.

31 Weverton: That is really cool. So you did talk about some things that I believe there were very memorable for you. But I don't want to be too leading. So I will restate the question. And if that's the event, then I'll just take it as your answer. So so far, What has been the most memorable aspect of your time in the PhD program?

32 Jennifer: Yeah, I would say memorable for me would be like just experience of having a time to reflect on things that you normally were just, you know, an undergrad, you would take a class and just make sure you pass it. It was memorable that in grad school, you would take a pause and understand the deeper meaning behind us. behind those topics. I think I told you about measures theory, it's, It is the only time in your life where you are solely focused on understanding and studying. I mean, that sense is very unique and very memorable. Not as a postdoc, not as a professor, that is, you know, it's, This is the only time where you can in peace and quiet and with without a lot of responsibilities, or almost no responsibilities, at least for the people that you know, people don't have a family or don't have, you know, more pressing responsibilities. Your only job is to think and understand and get behind. Get behind the curtain and each topic that you deem important. You have that, like, you know, you have your own, you can determine what you want to study, Nobody's forcing you to study anything. And I think that's, that's amazing, that's really memorable. You make your own path, you study as hard as you want. Within reason, right, but you can go as deep as you want. And That's why you know, from the same program, you have very different experiences and very different people.

33 Weverton: And can you tell me about one class you took in your PhD, Tell me just like, what was the course about and what it was like, I just want to hear like basic description, and maybe what you did to prepare for the class and so on.

34 Jennifer: Let me think. Like a typical math class, a very average one?
35 Weverton: It could be class be any class.

36 Jennifer: It could be any class. Um, I think for the regular classes that are like, for example, I don't know, algebra, like the higher level algebra, I think I prepped a little bit, That was my most challenging, and I don't think I really enjoyed the experience of the class. So what I did was kind of take it like a, like, you know, like, like a draw and study, as much of it as I could be for him. So I wouldn't be overwhelmed the first few weeks, because they go really quickly through the review. So and I would write, I would usually after, you know, the professor taught the class, but make a list of the stuff that, you know, we're supposed to have learned, and kind of review that, to try not to, you know, let it pile up or something because I knew I didn't like working on it. So if I broken into little pieces, It was a lot more parable. And, well, I do, I would, I would work with friends. That has been been one of the most useful things for me, I do not work well, on my own. When I get stuck. I know some people just kind of get lost and thought they think you know mulling over for a couple of hours or days, and it works for them, it does not work for me, I work better when I'm in a group. And we're just bouncing ideas back and forth. And just you know, sometimes hearing the word, Something will just like trigger a thought in and you can solve the problem faster. So I relied a lot in group study, like group studying to to pass the exams, we would, we would prepare for homework as well. We will always do homework in a group. And a very tight knit group of kids that we will work with. What else did I do to prep for that class? Solve a lot of problems towards the end to be able, Yeah, uncomfortable, kind of be in an uncomfortable situation, kind of, you know, no book, no notes, nothing. Toss the problems in there. Can you do it? So I kind of regress to kind of like, you know, high school time when you would practice for an exam? And I think is because I do not do any tests well. So For me, the more used I am to that feeling of doubt and uncertainty, While you're solving a problem, and just kind of being able to still remember, you know, the stuff that you did. So that would help me just get used to the discomfort of taking an exam and a topic that you don't like. So Yeah.

37 Weverton: Can you tell me if that was a particularly good class, or maybe a bad class?

38 Jennifer: it was an average class? It's just the topic that I did not Yeah, it wasn't really a topic that I did not like. I think it was just because I took it very far apart from like, my intro algebra, because I didn't enjoy it. had a really great intro algebra class, but they dress it up really nicely. It still didn't do anything for me. So it had it had like a spectacular teacher. So then I put it off for like, two or three years, three years. And then I had to take the big people, algebra class. Oh, that was, that was not a very smart thing to do.

39 Weverton: So you talked about these friends, which were part of these groups studies, Can you tell me more about it, like with those people, you don't need to tell names, but who were those people how was the interaction?

40 Jennifer: So the, I am in the Applied Math floor. So it's most it's a very different crowd than the ones in the other floors. I think it's just a coincidence, but there's a lot of Chinese kids in the, in the, you know,in the applied floor. So they are younger than me thing by a year or two, the majority of them. And they were since they were better prepared in algebra. But clearly, since they were in apply, they did not like it either. We were all in the same boat. They had slightly better foundations than me. But they also disliked the class immensely. So we knew that we were in trouble if we didn't apply ourselves. And so we became friends, we kind of bonded over that, even though we were in the same year. But since we were next door to each other, you know, and like the offices were all lined up. We knew each other's faces. So it's naturally gonna be like, Hey, I saw you in the algebra class, Do you want to do the homework? So it and then yeah, I realized that they, you know, they all knew each other. And so then I just come was kind of added. So we became really, really good friends from From then on. And yeah, they are very methodical. We did it very methodically, because we didn't, we didn't have you know, any other Virginia's in our group. So I think in the other floors, a lot of the kids are this program, especially very into algebra. So that class for the majority of the kids and all the other floors is just the beginning, Right after the second algebra, their intro class, because that's what they came to study. But for the rest of us, that was the end of the last algebra class we were gonna take in our lives. So Yeah.

41 Weverton: That's interesting. Can you remember about the memories of interacting with the faculty with the professor, the person was teaching the class?

42 ll right. So maybe there was no moment that you felt like you did not belong to this program. But maybe there was a moment, they were like, kinda not sure if I should be doing this. Was there any moment that that happened?

43 Jennifer: I had a kind of distant, I never really interacted with the professor. And I guess it was like a lack of also, interest in the topic, I think when you're interested in the topic, you want to find out more, right? You want to create this relationship with a professor and try to extract as much knowledge as you can from them also, professor is kind of like was kind of like a very straight laced. So very kind of distant guy, he wasn't somebody that would encourage, you know, a very close communication, he was very standard kind of like, wrote the theorem, wrote the proof on the board, maybe one example, to try to motivate the thing. And that was it. And everything was in the book. So you, you know, in that sense, I was the book is very well written, the examples are very well thought, you know, that's what I put them in there. That I wouldn't say that the Professor really encouraged. So it was Yeah, I have, I have pretty close relationships with a bunch of faculty, you know, but I'm not with that particular professor, very distant.

44 Weverton: All right, maybe there was no moment that you felt you didn't belong to this program, but maybe there was a moment that you were kind not sure if you should be doing this. Was there any moment that that happened?

45 Jennifer: I mean, yeah, for, for me, it was, there was a point where I realized that I had chosen a very pure math centered program, and I was doing applied. And I, you know, I was thinking, Okay, I made the wrong choice. But I think it's also due to the fact that the kind of not the industry, but kind of like the, the entire area, the applied area has kind of shifted slowly in the past 10 years, which, and those changes take time to register. So for that particular area that I was doing, If I had been savvier, I would have realized that I would not even have had to choose a math department. But that was the that was a big decision that I made at the beginning of the program, I, you know, before I even applied to the program was like, wasn't gonna apply to math department, it was going to apply to, In my case, a computational biology, or more Biologically inclined programs, and there are a bunch of those hybrid programs that are very heavily, you know, mathematically heavy, but they also have this big biology shift. And my issue, The reason why I, you know, I went back and forth is because I don't have a biology background. In my undergrad, It was all pure math, like, I never took anything applied. I did my thesis and applied mathematics, but it was all

from like, in math class. So I was completely, like, out of my depth when it came to biology or anything. I mean, I hadn't even taken, you know, past biology 2 or something, it was really basic stuff that I barely remembered. So Yeah, I felt that this is not this might not be the best place at some point is, you know, like, you know, when there are in the classes that you want to take, you're like, Okay, I really need this class. That's an electrical engineering. And it clashes with my math class. And I can't take it because maybe this was not the you know, it's I feel like the classes that I need are spread in like so many departments, like and, and bio stuff. And then there's like the engineering stuff. And so I have felt that I'm kind of like, maybe, maybe I could have been a little bit more applied. But in the end, when it comes to mathematics, I have the solid foundations that have allowed me to kind of self study, Those are the thing. So in that sense.

46 Weverton: So, let me see if I got, it like, so if it's, like, heavily mathematics, you would be comfortable with it. But the problem was that there was a lot of like, different fields that you

47 Jennifer: that I need for my research. Yeah, So for my research, I need all these other tools that are not in a math department, like three quarters of it is in the math department by To make things attractive, you know, to publish to so stuff like that, to come up with projects, You need a little bit more applied stuff that they you know, that's programs not heavily centered around.

48 Weverton: Cool, so can you tell me, what are you thinking about doing after your PhD?

49 Jennifer: Yeah, so I will be applying to jobs this semester, I'm going for academic jobs solely. And ah, My plan is to do a kind of two year a job application process, If I do not get a job offer this first year, then the next year, I will apply to some research industry jobs. So I will grab it, I will try to gravitate you know, as much as I can. Towards jobs that entail research. Like as much as you know, as possible within the private industry.

50 Weverton: So for the academic jobs, What does attract you to, to become an academic?

51 Jennifer: Um, I think it's trying to create, you know, a line of research, trying to develop kind of my own perspectives on specific topics and being able to, you know, leave a mini legacy of sorts of, you know, I studied these things, and this is my take on them. And I am also really interested in forming a lab having my own lab.I want to be able to work with, you know, a lot of people and trying to answer, the questions that I have because I do have, you know, a lot of ideas, the problem is I don't have all the expertise to answer them. So I feel like a lab would be an ideal environment, both for post on know, which is where I'm trying to go to, you know, allow that has a lot of people that you can exchange ideas and information and also areas of expertise back and forth, kind of make this whole like, you know, body of work. and answer the questions for me, honestly, it's right now it's more about answering certain biological questions and try to make the math work for that. Rather than, you know, just doing math for itself.

52 Weverton: So you talked a lot about interaction with people, you feel like it's important, you want to be sitting in a place where you can interact, was there like, anytime that you felt like you were not being able to engage with people, like there was no room for a felt like, maybe isolated, or was there anytime during the program?

53 Jennifer: I mean, definitely, definitely, um, I would say there's always people to hang out with socially. But you need, you know, and that's nice, but you do need people to hang out with, When it comes to, like, hang out academically, You need to have those debates, you need to, When you're stuck on something, you don't need to waste all this, you know, resources all by yourself to try to fix something or try to move past that point. I do think that just because of the nature of like my area, so small, In this particular department, It's hard to have that sort of interactions, social interactions are always available, you know, the kids are nice to go hang out with them. But I think more academically, like, you know, intellectually nourishing conversations and debates are on the like, very, very scarce that, unfortunately, for me, I entered at a point where there was a huge lab, you know, in my area, there were like seven or eight people in the group. And then suddenly

everyone graduated. And the first two or three years that I was here, So I never really had a long time to grow alongside this people, like they had, you know, among themselves. In the you know, those are matters of chance, it's just luck. Sometimes there are groups that you know, hover towards, like a specific area, and sometimes there are some years they don't. So In that sense, yes, I have definitely felt very isolated, very alone, like I have to battle uphill, All by myself, or what I do is I outsource, I have friends outside of the department. And I refuse to you know, just be because it's absolutely horrible to feel, you know, alone, like you have nobody to you cannot burden your advisor with certain questions. That that's why your peers are there, you know, it's not a big problem to ask a friend a coding question, it is a huge issue to ask advisor coding question. You do not take kindly to that. And I cannot blame them, right, you know, not going to be looking over your hundred years, lines of code and see where you forgot the point, a coma, whatever. So Yeah, I usually outsource our friends and apply math and other universities that I have shamelessly reached out to and have asked for help. So Yeah, it's definitely been times when it's been tough.

54 Weverton: All right. So can you tell me what is a typical day in the life of a strong student in your program? How would that look like?

55 Jennifer: Um, I don't know, I think, um, I've seen them are very disorganized, Wake up, really late, show up, you know, to their offices in the afternoons and just kind of read some stuff. I've seen them You know, the other ones that you know, are doing serious work and then they kind of keep to their to themselves, I haven't really seen them interact a lot, the ones that are, you know, doing a lot of work, At least us on the pure mathematician side, just kind of, He's very eccentric individuals that kind of hang hang out on their own in their offices and their little both, I think the applied people, the ones that are very strong are quite the opposite. Extremely organized, wake up at the crack of dawn, you know, and they're there first thing in the morning, and they're the last ones to leave at night. Sometimes they, you know, stay there even longer than, you know, you would expect until the early hours of the morning. have found them to have like a very organized schedule, Please come The kids on my floor that I've seen how you don't see them, you know, showing up without showering for four or five days. there they're very, they're very have seen me very methodical. It could it could also be you know, it's just a coincidence, of course, there's no rule for those things, but very organized, like their meals are always at the same time, they go for walks at scheduled times, because they need to stretch, you know, live in front of the computer for so long. They go to the gym, like twice a week, Even if it's for a little while. And then you know, they walk back. So they have these kind of almost, I don't know, meditation, like, rhythm of life, you know, they're very, I never seen them freak out either. Very calm. Very, very calm.

56 Weverton: Can you tell me about mathematician, you know, in your department that you admire?

57 Jennifer: um, who I admire? Like could be professor or? Oh, yeah, for sure. Yeah.One of my co advisor? Do you need to name? or No? Okay,

58 Weverton: you can give him like a fake name.

59 Jennifer: Oh it's okay. My co advisor, he is somebody that I really, really admire. And the reason is because he is incredibly multi disciplinary. And he works with so many people. So he has like, 20 students or something, or 20 collaborators, and in his group, especially this year, he is swamped with people and you know, his, He is so creative, and he's able to have you know, these answers to all these different I mean, nobody has, you know, the same topic isn't like one uniform area that they all develop is just completely different some are, machine learning, some are in optimization summer, and, you know, like more engineering based stuff. And I think it's amazing that somebody can keep so many different thoughts, you know, in their head and be successful at, like, you know, working with all these different people from all different backgrounds. And also, he is really kind. Usually people that are so you know, driven and busy have very short tempers, and you can't really blame them because they're under so much stress. And for somebody that publishes, you know, he publishes a ridiculous amount of papers every year that, you know, makes you wonder, When does he do it, you know, he has a kid, he has a family. But, you know, no matter how I assume he must be a little bit pressure to be like any normal person, he cannot be

a superhuman, but he, he's always smiling, and he's always happy. And whenever you have a problem, you know, you can go to him and know, he may not, you know, do it for your solve it for you. But he has a such a kind of way of kind of telling, you know, all things over, Think about it carefully, I suggest these options, Go give it another go. I don't think I have ever, You know, felt scared, you know, in His presence or worried about oh my god, what is he going to say? What is he gonna think? I've never felt judged by him, which I think is a huge thing to not feel judged by a superior or an advisor, you know, because when you go to your advisor, You know, you're like, Okay, I cannot say I'm stupid, I cannot, I have to be prepared, I have to be ready. And I think, with my co advisor, I can actually, you know, just be honest with him and be like, okay, I'm stuck in this ridiculously simple thing. And, you know, he doesn't need to do it for me, but it's just the way that he, you know, he lets me calm down and just kind of be a little bit more logical about the situation, instead of being in a panic, you know, like, freaking out because, you know, you're letting someone down or something. I think that's amazing. I think just having that ability to handle people so well. And, you know, juggling so many things at once, and always having a smile, and, you know, a kind demeanor for everyone.

60 Weverton: Was the time that you interacted with the faculty and you felt really scared?

61 Jennifer: Yeah, my advisor is like, very the opposite kinda of, so I have these two kind of offices forces. I don't know if it's just the way that you know, they handle things or it's just, you know, their personality. By It's extremely stressful to be with somebody that you know, allows no mistake, no moment, if you show any weakness, you know, you know, they're not gonna take any pity on you. It's more the opposite is like, how could you not get, you know, things done in time? or How could you not have realized that you made a mistake in here, it's all so obviously wrong, you know, stuff like that. I think that just makes things worse, you're stressed out, you're already you know, if you make a mistake, he you need to correct it. So I'm not being told off about it. That's not helping, you know, it doesn't really help the situation. So I've definitely have those like polar opposite forces in, In my I think my life, but I will say, it is a very good motivator. Fear is a very good motivator.You don't want to let them down. And you feel that is almost. You know, like, it's, it's kind of like a parental, you know, like, because, you know, because just there, they're just so severe, you know, it's kind of like, okay, you can't, you can't fail. And I think that also, It gives you, you know, the energy to push on, I don't think is the most efficient, I don't think it's the best way and especially I know some people, which is completely not work with that. I happen to work fine under a complaint about it. I know, it's not the best way for you to do it. I don't agree with their methods. But I know that's coming from the right place, you know, I know that they're just trying to make me into the best researcher that they can. But I've definitely felt uncomfortable, kind of just to get out. Like you're letting someone and judged, of course.

62 Weverton: So can you tell me like, like, how he became your advisor? Was it assigned, you chose him? Like, how is like, how did that happen?

63 Jennifer: I met my advisor before I came to grad schools, so it was kind of so many very, you know, well known in the field. And I just kinda of, I really liked the topics that they were working on, It was such a perfect combination of applied and theory that, um, so there were like, and then there was also, you know, like experiments from the real world that I follow, you know, this is fascinating, you can actually, you know, use data from the real from real world and get, you know, use amazing mathematical tools to kind of figure out an answer to the questions. And I, you know, so I am in the talk was really, really impressed. So I kind of kept, you know, I kept a list of all the people that I wanted to work with, I applied to those programs. And So yeah, I chose my advisor before I came here, and then I think I was like, pretty chill, I think when they don't feel they're involved. So the first few years, when we were doing like many projects, it was not a big deal. We're like, Oh, really easy going like, okay, you know, it's fine. And then when I actually started, you know, when I already like pass my exams candidacy exam, that's when you're formally you know, committed to your advisor. And it was kind of like, okay, now, I gotta crack the whip. So I felt definitely the reins tightening and,I've been, I think, productive enough.That's maybe been worth it. But I, I do think that in, in my case, I've learned a lot. I've learned a lot, as you know, from

the good and the bad. How to handle people and how, I mean, of course, I admire my advisor, but it's definitely helped me analyze what I want to do, you know, in the future, and because I, if somebody had asked me, you know, do you want to be is like, very driven, you know, sounds like sounds like a CEO, you know, they're just like, okay, you need to be better and you need to and also, I would have always thought that that's the ideal persona to take when you're leading a group, and I don't think it's the most effective anymore. So I think of that only.

64 Weverton: Nice. Why do you think the average PhD student in math decided to pursue a PhD?

65 Jennifer: I, here, I felt it's kind of a I did not expect So many people to be so interested in, you know, teaching. But a lot of people here, the average, I would say, is teaching. And then there's a lot of people that just like math, And that's their main thing, they just want to do it as much as they can. And I, ya know, that's my theory on it. Probably, you know, some people just enjoy doing it. But I don't think they think too much ahead. like, you enjoy doing it now. But then later What? You know, I don't think they plan ahead. And I've asked them, I've asked them when they come in first year, like, Okay, what do you want to do? I don't know. But I love math. Like, oh, God, maybe that's not a good answer. For rock awakening, because We all love math, But some fields are just not hiring, so fields aren't dead. So You know, if you're not aware of all these things, Some programs, you know, keep out data fields on their program, and then those people don't get hired where they want to do so you can envision one thing for yourself, but if you don't back it up with numbers, if you don't check, how many people got hired, you know, with 10 year in these areas that I want to dream over? Who's getting funding? Because, you know, the NSF thought certain funding for specific areas? Kids Don't think like that. So Yeah, I think the average one likes to wants to teach a lot of them love to teach, and a lot of them just like math. So that'd be my guess.

66 Weverton: And If you weren't accepting a student to mentor in math, What qualities would that student have?

67 Jennifer: I think for me the most important thing would be a desire to learn and commitment, to, to the, to the, you know, whatever area that they want to pursue. Yeah, I think desire to learn. And just because I don't, you know, I don't think even then being intelligent, you know, particularly gifted is important at all. I've seen people you know, I've seen people that have gotten, you know, really good results. And they have not been, you know, the the smartest in the room, it's more about, are they committed enough? And some people, you know, they will go to any lengths to do so I wouldn't want somebody willing to work willing to learn, and just be completely open in that sense.

68 Weverton: And, can you tell me about your impressions of the professors in the mathematics department?

69 Jennifer: I think I think a lot of them, of course, it depends on the hearing, I think a lot of them, you know, grew up in a different world. And I think, you know, some professors, you know, they, they grow with, you know, they changed with the times, and they become, you know, they are keeping up with the changes in academia. But I've just noticed, like, there's still a lot of professors are very old, maybe they don't tell us, but they seem very naive when it comes to how the world is now. So I think they're there, you know, everyone if hey got tenure, right there. They're really good researchers, you know, probably 90% of them have been, you know, impeccable. Research credentials. Thank you feel that a lot of the older crowd specially. You know when I turned to them and kind of asked them, okay, There, you know, where do I get a job, there are no jobs. It's really hard, like, you know, and, and I tell them, like, my friends experiences, and, you know, like, look at this, this guy, you know, three, four postdocs, and then why, you know, he's working as a data scientist, and all this work for what you know, and they're just kind of like, yeah, you know, it's who wasn't like that in my time. So you have a lot of these people who, you know, had their ideas they were so, you know, I think, just have this idea of how academia was, you know, you finish your PhD program, and that you got hired in you did with your advisor did and maybe you improved upon it, you know, and you found your own, you found your footing Once you had, you know, you were tenure track, which is like a huge amount of job security. So I think they had a lot of more time to grow. They don't realize that now you need to produce almost a finished product.

As a grad students, they did not have to be like that. So I think in that sense, you know, research wise course, guys are amazing, Teaching wise. The ones that try do the best that they can, but also, you know, grad school is not it's not a place where you're coming to meet great teachers. That's, that's just not the nature of it. That's right. So I wouldn't say teaching the thing is spectacular. With there, of course, you know, exceptions. There's a few that are incredible when it comes to teaching. But I would say yeah, there are a lot of professors still hold on a lot to the past. And then there's, of course, they're really young ones. That still don't have anything to say yet. Because there's just hasseling. So there are a few that you can tell are moving in the right direction, but it's a slow, you know, transition to the kids, the younger ones are just starting. So we know we have a pretty mature department I would say.

70 Weverton: How do you think we could encourage my students to study mathematics?

71 Jennifer: I don't know Exactly. But, I guess if you, well for one, I don't think people should necessarily be encouraged into higher education. Just for the sake of it, I think people should be encouraged into college as a kind of, you know, like a middle ground. I think people that want to work in an area, where developing new ideas, and solving, You know, unsolved problems, That's when you need to take the next step and kind of suggest them, right. So if you have a kid that's asking the right questions, that's kind of has the curiosity and has that drive to kind of sniff their way into what else is there, that I think you should redirect them to PhD program, but I don't think, you know, if I have a class of 20 kids, that would just tell them, you know, or try to encourage a majority of them or as many as I can to do a PhD. One because it's, like I said, it takes the right personality and the right, you know, life goals. And two, because it's five years of your life, but it's a pretty big commitment for something that a lot of kids, you know, So, you know, or it may not be may not make the most out of it. So Yeah, I don't think I would not encourage them just, you know, just, But I would tell them that, yeah, if they want to learn, you know, kind of get to the latest of this field, you know, what is being developed now, should do a PhD, If that's what you want to understand, that's what you want to work on.

72 Weverton: Nice, what change should be made in the PhD program?

73 Jennifer: I think modernization is the most important. I think there should be some more guidance from especially the younger professors trying to shine the light on but the thing is, I just don't know, if they even have the awareness, you know, do they know what fields of mathematics are actually, you know, growing, You know, who eat because, of course, it's marked by tendencies, such as, you know, the, the fields metal, usually, right, because anyone who's in that field, and in the vicinity, all the money is being funneled there. And in mathematics, they hire Sophie, like such few people in each area every year, that there's not really, you know, for anyone really. So, so I would, yeah, I would just tell students, you know, I know you like logic, But nobody's hiring your logic, you know, it's a dead feel, or something, it's somebody told them, somebody told them that they're doing, they're just running down a road that has no way out. So I think modernization on areas like the areas they have to try to hire, the areas that are Now the problem is they have professors that have been, you know, there for 30 years, and maybe continue to in in the same hole. But I've been taught for the past 30 40 years. So that in that is a tenure issue, you know, you can't really do anything about that. But I would, I would encourage is sure, you know, you respect these people, these people are part of our staff, you know, there are professors, but there, but meaning the new ones, the new students that we're producing, cannot be solely in their fields, or maybe Co co directors. I know some professors hate it, but maybe some will relish that the opportunity to have a young Professor with their ideas, I want the one that was newly hired to work with the students and kind of redirect them in the areas where they're most needed. Because a lot of kids go into areas that they like, For those areas don't need that anymore. So I think that is important to go, you know where the money is to. Yeah, and I do think they need to kind of update the requirements when it comes to like qualifying exams and stuff like that, I think that is an eel of every single graduate program, you know, especially the reputable ones. And some of them are already changing to make it so that you are testing More research oriented abilities. Because in the end, that's the goal. And I think just yeah, should be geared towards, you

know, what is the ultimate goal? My trying to create people that can regurgitate, you know, five, six topics in one week perfectly, and you know, just be able to solve those problems. Our do I want people to be able to think critically, and how can I assess how critical how, if they have the tools and how critically they're thinking about using those tools? So I think, yeah, I've heard of, you know, programs, updating their ways of evaluation procedures.

74 Weverton: So Why do you think a student would give up, you know, obtaining a PhD in mathematics?

75 That's the most

76 Unknown Speaker

77 Jennifer:Every, every single I mean, the second you start doing your research, I think that's the most depressing and frustrating part, and I think is frustration. At least from my experience. I think that is the only reason why, you know, you just think, Oh, God, I'm out, you know, I wish I could just like drop everything and leave, because this is not working. You know, you've been trying to sell this program for months and months, you're trying to learn as much as you can about the problem and trying to tackle it from all these different areas. And if you keep hitting a wall, I mean, how much frustration can a human being take, you know, before you're ready to give up. However, I have found that in this particular program, the majority of the people that leave, were the ones though, had no idea where they were here. There wasn't like mathematics, and maybe they ran into a professor, that was mean to them. And they just, you know, throw up their arms was like, Oh, this is absolutely, you know, an acceptable or others that just don't see the point of it all, After two years of studying really, really hard, or, you know, and a lot of the people that didn't know what they were signing up for, I would say, so the majority of people that I've seen drop out, it's just people that did not know why they were doing it in the beginning, or didn't have a good enough reason, you know, because, you know, if you go, If you're sending up to do something for five years, you need a really good reason to stay there. And it's, it's, you know, it's painful, it's hard. It's a lot of sacrifice. It's not a walk in the park, but I would think this Yeah, the second one would be frustration, I've seen so many kids just feel really frustrated. Because in So what happens is, you know, they they pass their quals, That's a reward in itself. Oh, these kids that were brilliant students, they take one class, they excel, they take all the classes, and they're brilliant professionals, like, oh, you're smart, you're amazing, can solve all these problems. And then you give them a real problem that hasn't been solved before. Not one that, you know, is used as a exam question in every single, you know, like, I don't know, analysis class or anything. And, and, and that is when the real, you know, ability of a person as a mathematician relation, you know, pop up. And that's when a lot of these kids just, They can't, they can't do it. And they hate it. So I feel sorry, you know, for them, because they're used to be used to that quick reward. You know, you you solve your problem. Maybe you take a day, maybe you take a week. Well, a thesis takes years of hitting walls and walls and levels. And So I think in that sense, I'm glad that I wasn't a good student. I felt like I felt completely useless the entire time. So I'm used to the frustration. And I think that's why it's what it's helped me. kids that have not felt frustrated and have not felt that impotence of my brain has been stretched this much. And I don't think I can give any more. I think it's a very sudden unexpected feeling for somebody who has been dealing with frustration day in and day out. It's like, yeah, I've given like sweat blood and tears to this thing. It's still not working, you know, but I think that's why it's been easier for it's it's also easier for people that sometimes are bad students. They used to feeling not good.

78 Weverton: Nice, Awesome. I think we're done for today.