

P&A Member of the week interview 19

Name: Genevieve Schroeder

Year: 3rd

Group: Wen-fai Fong

Program: Astronomy PhD



This week's PAMoW is **Genevieve Schroeder**! Genevieve is a third year astronomy PhD student working in Wen-fai Fong's research group on long gamma ray bursts. In addition to describing her research Genevieve also taught me about the existence of a galaxy and an object in space that I had never heard of before. She also taught me a thing or two about the moons of Saturn, which are objectively the coolest moons. My favorite part of interviewing Genevieve was how her face would light up when she started talking about astronomy; she made me more excited to hear about galaxies and star formation than I think I have ever been in my life. In addition to her contagious enthusiasm for her research, Genevieve is passionate about doing makeup, which she describes as using her face as a

canvas for art¹, as well as making sure makeup is cruelty-free (not tested on animals). In addition to all of this, Genevieve was also very open about her childhood growing up in a low income household and being raised by a single mother and how this affected her on her path to the PhD program. Please read on to learn more about Genevieve! I hope her enthusiasm translates as well through written word as it did speaking to her in real (virtual) life.

Research/academia:

Q. When were you first introduced to physics/astronomy? What made you realize you were interested in physics/astronomy?

A. Yeah! So, I was always in the advanced math and science classes in middle school and high school and one of those ended up being physics, in junior year, and I *hated* it. I hated physics so bad. The teacher, I thought, was awful - second worst teacher. My AP english teacher was worse, in my opinion. I thought the whole, projectile motion and trig stuff was like...*mimics a whooshing motion going way over her head* I had taken trig(!) and it just did not make sense to me at the time. But then there were like three days where we talked about astronomy and those were the only three days I did not hate that class.

I was really good at math and science and I knew I wanted to do something STEM for college, but I wasn't passionate about any of it; and then I had those three days and I was like, "You know, that was kinda cool! Maybe that's what I wanna do!" But that was about it and I just kinda ran with it going into college. Then my first year I took an astronomy class for non-science majors and I was like, "Hell yeah! This is it!" (**Why did you take the astronomy for non-science majors if you were doing math and science for that long?**) Ah, because my undergrad gave us pre-major advisors and mine was in the classics, he did, like, Greek mythology and stuff. So when I presented him with this astronomy class he was like, "Yeah, that one sounds good!" And I was really unprepared going into college, so I didn't really look at the suggested classes and everything really well. I also took the wrong physics class; I took the "Physics for Engineers" because the physics for Physics kids was called "Advanced Physics," and I was like, "I hated physics! I'm not advanced in it!" So I took regular physics. It was mostly that my pre-major advisor didn't tell me any better so I took the one that sounded good. But! It worked out because, the class that I should have taken as a freshman, I took as a sophomore where I had way more math background at that point that it didn't terrify me. Whereas if I took that astro class as a, like, fall freshman I would have probably cried (laughs).

Q. Did you have a particular experience in undergrad that stuck with you? A person you looked up to or a really convincing professor?

¹ If you have met or seen Genevieve I think you will agree that her makeup looks flawless, vibrant and professionally done every day.

A. Yeah, so sort of along those lines. Since I took the wrong astro class and also the wrong physics class, I didn't really get to know anyone in my major in my year until my sophomore spring, when I was finally sort of caught up. And there was a physics and astronomy library on campus and I walked into it one day and I saw a bunch of kids from my astro class doing homework together. And I was like, "Hey, are you guys doin' astro?! Because I need help with the astro!" and they were like, "No! We're doing Linear Algebra homework!" and I was like, "Great! I'm in that class too!" And it stuck out to me because it really showed me how collaborative it was, like, I didn't know any of them other than as faces in the class but I just sat down and they just accepted me right away. I was just like, "Wow! This is nice!" And I ended up working at that library later; I got a work study job there which was fan-tastic because I got to do my homework where all my friends were but also get paid for it. **(That's awesome!)**

Q. Was there a pivotal moment that made you realize you wanted to go to graduate school?

A. So I picked this question because the answer is actually no. I feel like a lot of people have that moment, but to me grad school was kind of presented as the sort of obvious next step. It was like, one of those summer research things and they had a little presentation on grad school and they were basically like, "If you wanna do anything in astronomy, you should probably go to grad school." I was just like, "Oof," and then they were also like, "and they'll pay you to go to grad school." And I was like, "Nice!" So at that point I was, like, 20 and I was just like, "I dunno what I wanna do after college! Tell me what to do for another five years? Sounds great!" And so, I was just like, "Okay! That's the obvious next step! Guess that's what I'm gonna do!" **(And it worked out?)** Mhm! I'm having a good time! I also, when I went into undergrad I didn't realize what you did with astronomy; I knew it was interesting to study, but I didn't realize that there was research, so much. So that was another thing where that just kind of showed me that I want to go to grad school because I can actually research in astronomy, not just learn it.

Q. What are your research interests? What is your current project?

A. Broadly speaking, my research interests are star formation and planet formation. That's not necessarily what I'm doing but sort of. So currently my specialty at Northwestern is following up gamma ray bursts with radio astronomy. And so my current project is, I am working on a long gamma ray burst. Long gamma ray bursts come from the collapse of massive stars and massive stars usually happen in star forming regions because they die before they can really get kicked out of home. So I'm trying to model the radio afterglow of this star to try to figure out more about what happened in the environment where it died and that can also kinda give you some idea as to the star formation happening in that region.

Q. Did you encounter any barriers to applying to graduate school/ pursuing an advanced degree in STEM? How did you overcome these barriers?

A. Yeah... so for one I think that me generally being underprepared; like, I didn't realize that in college most people did summer research so, again since I took the wrong classes my freshman year I didn't do anything my freshman summer. It wasn't until I was in the right classes that people were like, "You should be doing research." And then my imposter syndrome got the better of me where I didn't reach out to professors to do that. So it took me a little bit to get started. So that was one barrier, my lack of awareness of what I should be doing.

Another barrier that I'm sure a lot of people felt, was just the sheer cost of applying to grad school; like, taking two standardized tests and applying to, like, ten or so schools is a lot of money. I also found that it was difficult to understand how to get fee waivers. Some schools were easy, they were like, "If you have this grant or this other grant that shows financial need, just have your financial aid counselor send that over and we will give you the fee waiver!" which is fantastic! But some were, like, "If you email us..." and I was like, ...but, what if you reject my request for, like, not paying? It's super uncomfortable to, like, have to beg for money, basically. I much prefer the schools that were very clear, like, "We will give you a fee waiver if you have these qualifications," rather than, like, grovelling for it. **(Yeah that doesn't make any sense)** Yeah and I think it's because they don't want too many people asking for it, but also... it kind of forces somebody to flash how poor they are, which I don't love.

Personal life:

Q. Where did you grow up?

A. I grew up in what a lot of people would refer to as the "upstate New York region." It's technically the, like, central-New York/ Finger Lakes region. Depending on who you ask sometimes upstate New York is the part near Vermont and New Hampshire... whatever, but yeah, that area.

Q. Is there any particular part of your childhood/family life that you think is important to shaping who you are as a person and/or as a physicist/astronomer?

A. Yeah, I sort of alluded to this and I also talk about it a lot so some people already know, but my parents split up when I was three and I stopped talking to my father at the age of 10. Also my father was a truck driver without even a high school diploma. My mom had a bachelors degree from a state school in New York. So I grew up, like, single mom, just me and my sister, pretty low-income; like, we weren't the worst of the worst, but we were pretty low-income and I find that a lot of people in academia, especially the higher you get, it's like, a lot of people have two parents and very successful parents - which is great! I have no problem about that; I'm so happy for

them to have a normal childhood, but I have 60 grand in student loans and I find that a lot of my peers do *not* have that and they didn't have to take out student loans. Also the fact that some people are not able to do academia because they're too afraid to take out that amount of money, which is also totally fair. School is a scam (laughs); but also in conjunction with that, I lived in a small town and going to college was the end goal, but like, that was it. And a lot of people went to state schools and community colleges which is fantastic, but I wanted to go to potentially an out-of-state school -I ended up in state- but I went to a private university so the guidance counselors weren't, like, super well-versed in helping me out with those types of goals because they were very used to the SUNY [State University of New York] school systems and the community college system. Also both my mom and my sister went to SUNY schools, so, like, also family-wise nobody was prepared to help me out with that.

Also along those lines, I'm poised to make more money as a postdoc than my mom makes. Which, like, degree-wise makes sense; I'll have a PhD and she got her masters when I was in middle school, but the fact that she's 30 years older and also my mom and that I will be making more money than her is really weird to wrap my head around. So, I think that all has really shaped me a lot in who I am and it's good to, like, keep that perspective that a lot of people take very different paths to get to the same place.

Q. What are your hobbies?

A. So, I really like makeup (**Okay, yeah, I am obsessed with your eyeshadow it's so amazing**) Thank you, I appreciate that. Eyeshadow is my favorite. I was super into art as a little kid, but going into middle school and high school taking advanced courses -and I was also in band; I played the trumpet- my ability to take any type of art course really, like, decreased as I got older. So I started doing art on my eyes instead. (laughs) I think it's like... it's pretty apparent, usually, that it's something I'm into, but I don't really talk about it a lot because I don't know how to talk about it without sounding vain. But it is just my version of being creative every day. (**Yeah, it would be kind of weird to be like, "hey guys doesn't my eyeshadow look amazing? Aren't you gonna ask me about it?"**) (laughs) Yeah and I find some people are still somewhat uncomfortable talking about it. Like, I was super uncomfortable in undergrad when I really started getting into it, because I would be around a bunch of, like, guy physics majors and then a girl would compliment me and I'd be like, *mimics cringing* "...thank you" 'cause I didn't want to be, like, the vain girl that cared about her looks, or whatever. But also I did spend a lot of time on it and I appreciate the compliments!

(**Any other hobbies that you want to mention?**) Interest-wise I really am interested in exercise science. I watch a lot of youtube videos on that. I don't implement most of it. Like, I go to the... used to go to the gym before pandemic, but I don't implement most of it because I'm, like, scared and also untrained. But I find it very fascinating to learn about. (**Interesting, usually people who are into exercise**

science are, like, die-hard pro-athletes) Yeah, I think it's just the, like, format of watching an interesting video but also learning something; because I've always enjoyed the learning aspect of school. So it's just that I have new niches of things that I learn about.

Q. What is your favorite...

book?

A. Uh, so I... don't read as much anymore as I used to. So I'm just kinda gonna plug my most recent book that I also think is fantastic; it's *Devil in the White City*. In case anyone who reads this doesn't know it, it's about a serial killer at the Chicago's world fair. So, you know, it's very, like, appropriate, it was fun to read about different places around Chicago. But, also it's super cool because it's written like a fiction book; like, the character development and the colorful language, it seems very fiction, but it's actually non-fiction! All of these things actually happened! So it's, like, very easy to be engaged in this book even though it's non-fiction, which I sometimes have issues with. **(That sounds like a really good book!)** Yeah, it's cool to read and like, "Hey! I know that place!" Like they mentioned Evanston and I'm like, "Hey! I live there!"

color?

A. So I wear a lot of black, but my favorite color is purple. **(Perfect)** Yeah! (laughs) When I was a kid - I was, like, eight or nine- we moved into my grandpa's house and it was the first time I ever got to pick my room color and I picked this god-awful shade of Barbie pink. And I, like, regretted it as soon as the first stroke went on the wall and it was so much! It was cute in a paint-swatch, but maybe a nine-year-old should not be picking out her own paint colors. Either way, since then all I wanted was a nice, lilac-colored room and in ninth grade my mom bought her first house and I was finally able to get my lilac-colored room and it's been a decade and I have not regretted it one time.

movie?

A. I didn't mean to keep this question in 'cause I'm really bad about movies; but, to go with the season, I think *Beetlejuice* is a fantastic spooky season movie. It's very entertaining; I like it a lot!

galaxy?

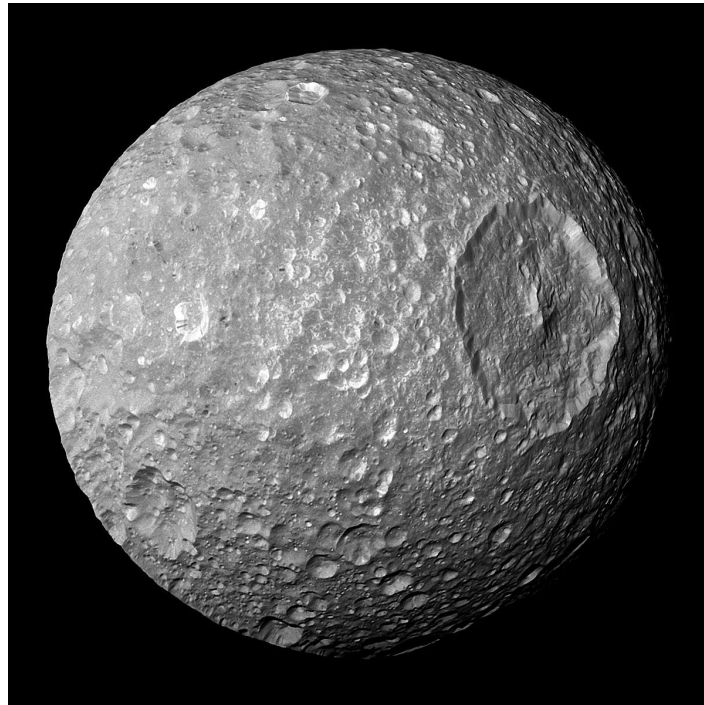
A. M106 - Messier 106 - and solely because my birthday is 10/6. But it's also kind of cool; for Raf Margutti's radiative transfer class we had to pick an object in space to model and I picked that galaxy. So I did a little modeling thing with, like, radiative transfer with it.

planet?

- A. Yeah, Saturn! Saturn is the best planet; it has the coolest moons; I have a whole spiel written about how cool it is. I've done the CIERA astronomer evenings and Saturn has the best moons. There's one moon that looks like the Death Star, it's called Mimas. There's another that looks like ravioli and it's called Pan. So, it has the best moons therefore is the best planet.



Pan (above) and Mimas (below).



object in space?

- A. That's the one I added because Eta Carinae is like the coolest system there is. It's, like, this massive star system; I think it's, like, 30 solar masses. Or one star is 30 solar masses the other is, like, 100 solar masses. It's on a super eccentric orbit where at closest approach they get within, like, the distance of Mars and the Sun, which is super close for these giant stars! And it has some

really cool behavior; in the 1800s it was the second brightest object in the sky because, like, some eruption happened. The current theory is that it was a triple-star system and one of the stars got eaten by another and that's why it's so crazy right now. Which I think is so cool. It also looks cool if you google an image of it.



Here was my search result.

series (tv and/or mathematical)?

A. *Bojack Horseman* on Netflix. It's a really good series. I think it delves really well into the subject of mental health and sexuality. Also the final season takes place in Chicago and there are some *fantastic* jokes about Chicago and, like, what constitutes as Chicago versus the suburbs. Also Mr. Peanut Butter went to Northwestern, so...

animal?

A. So I love cats! Cats are amazing, but also, whales. Do you ever think about how big a whale is?! A whale's head would, like, fill my entire apartment (laughs) they're so large! It's just crazy to remember that they exist and how big they are.

sport?

A. So I don't actually really like sports, but I am not allowed to exist in my household without being a fan of the Buffalo Bills, the football team. So this is solely for my mom.

season?

A. Fall! Even though it's way too short. The couple of days where it was like 60 degrees and the leaves were changing, fan-tastic! Just wish winter didn't come after it.

greek letter?

A. So I think ξ it's really fun, really curly. I did take a Greek 101 class in my senior year of undergrad so I actually learned how to write all the greek letters. I highly recommend to anyone in physics to actually learn how to write the letters. I think my favorite letter is actually γ because my name starts with a 'G' and I also study gamma-ray bursts. The lowercase is nice and elegant. The uppercase is awful! I always try to make it an 'F' but the lowercase is really cute.

Q. Is there anything you are really passionate about outside of academia?

A. Yeah, so I kind of mentioned that I really like makeup. I watch a lot of beauty youtube -there's some great beauty drama as well- but beauty youtube's really good. But also just like, cruelty-free makeup is super important. There's a lot of makeup that's tested on animals for no good reason. The reason is that China still has some archaic laws about how cosmetics can go into their country and how they have to be tested. But, like, they make 3D printed skin these days that you can test makeup on. So there's just no reason to do, like, actual animal testing. I'm very passionate about abolishing that. There are some hopes that China will be getting rid of some of their laws; they've made steps in the right direction, but... Yeah. I'm just passionate about not abusing animals for beauty.

Q. What is a talent that you have that you are proud of?

A. So, two things come to mind. One I'm not sure if I'm proud of but I'm very good at and it's finding people online. Like, if you give me a little bit of information on someone I can find their Facebook or their professional website or their LinkedIn very easily and it's to a point where some of my friends are like, "Hello! I know this person's name. Can you help?" (laughs) Which, I don't know, I'm kind of proud of it, but also it's kind of creepy. Then the other thing I think I'm really good at -I don't know if it's a talent- is complimenting people. I've just made it a mission to, whenever I think something nice about someone I will just tell them rather than keeping it to myself. It's not as good anymore in COVID days where nobody wants to talk to a stranger, but I really enjoy complimenting strangers in the past. And also because I'm a little bit socially-anxious and it helps me break out of my shell.

Q. Do you speak any languages other than english/american? Was english your second language? If so, how do you think that contributed to the way you experience life at NU/in general?

A. So I don't technically speak another language but I did learn french in middle school and high school and this question just kind of prompted me to maybe re-learn french. I went to France and the level of knowledge was, like, so low at that point that I was trying to buy a baguette and I said, "Une baguette, please!" instead of, "s'il vous plait," and I was, like, ... goddammit! I can't even get this one line correct! This kind of was the prompt, "hey, maybe I should learn french again." Because I have half the knowledge somewhere in here *motions to her head*.

Q. If you could do any research outside of physics/astronomy what would it be and why?

A. Barring the fact that I have not taken a chemistry class since high school and that... I didn't hate chemistry, but there were certain parts of it that just did not work out for me. But assuming I could get past that, I think that cosmetic chemistry is really interesting; the science behind, like, making skin-care products is so cool! I think it would be cool to do that. I don't know if I would be able to do that if I wasn't doing astronomy, but... **(Nah, it's a hypothetical situation)** Yeah, skin-care science!

Surprise questions:

Q. If you had a superpower, what would you want it to be?

A. That's a really good question; there's a lot of answers... I mean, I feel like teleportation would be pretty neat! It would really help me out these days where I don't want to take public transportation but I do want to be places that are not my apartment. **(Yeah, teleportation would be very practical in pandemic times)** yeah! (laughs)

Q. What is a talent that you wish you could have without having to practice?

A. I think general gymnastics. The ability to do flips and, like, not hurt myself would be so cool and it would be, like, the party trick I would annoy everyone with!

Q. What is the most (or one of the most) fun word(s) to say?

A. I'm blanking on every word I've ever known... Since I don't have anything good, I'm gonna go with "spooky" because I like the, like, "Spooooky" and also, spooky season. **(I know what you mean because the only word that comes to my mind is 'periwinkle')** Oh that's a good one! I guess, I know that words that have a 'g' in the middle are really fun to say, but I can't think of any good examples of them.

Q. What would be the most boring superhero you can imagine?

A. Uh... it would be the person that you could ask when you can't find something that you know you put in a safe place. Or, not even just the safe place one, just if you misplace anything at all. You can just be like, "Hey, Mr. MisplacedMan! Where did I put this thing?" and he would instantly know. **(Yeah that is incredibly boring but very practical)** (laughs) I'm sure he would be very annoyed with all of the requests all day. He would just be like a glorified Google but for your own life.

Q. What is your favorite cuisine?

A. So I'm gonna go with, just like, generally fish because my mom did not like making fish as a kid. So I did not get to explore it much other than fish sticks, which are nasty. Also, like fish fry, which is fantastic! But, since moving out of her house and going to college and everything I've really gotten to expand my seafood knowledge. I haven't found anything that I haven't like yet, so.... **(except for fish sticks?)** Is that even fish though?

Q. When you are feeling down, do you have anything that you do that you always know will make you feel better?

A. So currently, with the quarantine blues and everything, I have been re-watching Safiya Nygaard's youtube videos. She does some really just strange things. She does, like, bad science. She took every scent of Bath and Body Works candles and melted them together to see what she would get. And she also wear's, like, really stupid clothing; like, jean jackets that have, like, four-foot long arms that are completely impractical and stuff. It's very entertaining, like, I've already watched all of these videos before when they came out and now I'm re-watching them just to make me feel better.