

# From Research Mathematician to Quantitative Researcher

*Ursula Gritsch and Melissa Yeung*

Ursula Gritsch (UG) and Melissa Yeung (MY) are Quantitative Researchers on BlackRock's Systematic Active Equity team, which boasts a more than 30-year track record of combining human expertise and innovative technology in pursuit of broad market diversification and consistent, differentiated returns.

### *How did you end up in finance?*

**UG:** After moving to Berkeley, California with my family, I decided that the loneliness of academic mathematics was not for me. I taught math courses at Cal for a year, then found a job at a tiny financial software company. It was hard at first. I had never really programmed, and suddenly, I was writing and maintaining professional code and implementing Black-Scholes style options pricing software. But I fell in love with writing high-quality mathematical software; it wasn't good enough that the code be right most of the time: it had to be right all the time because clients were making trades based on my calculations. I also had truly smart coworkers!

I eventually ended up at Barclays Global Investors, which is now a part of BlackRock. I have stayed at BlackRock for over ten years because BlackRock is first and foremost a fiduciary to our clients. Every math problem solved, and coding challenge surmounted helps us make better investment decisions for our clients. BlackRock also has a true

---

*Ursula Gritsch is a Quantitative Researcher on BlackRock's Knowledge Discovery team within the Systematic Active Equity business unit. Her email address is [ursula.gritsch@blackrock.com](mailto:ursula.gritsch@blackrock.com).*

*Melissa Yeung is a Quantitative Researcher and Portfolio Manager on BlackRock's Systematic Active Equity team. Her email address is [melissa.yeung@blackrock.com](mailto:melissa.yeung@blackrock.com).*

*For permission to reprint this article, please contact: [reprint-permission@ams.org](mailto:reprint-permission@ams.org).*

DOI: <https://dx.doi.org/10.1090/noti1842>

commitment to diversity and inclusion, which results in the variety of perspectives needed to be truly innovative.

**MY:** With the blessing of my graduate school advisor, on a whim, I spent a summer as a research intern on a trading and execution research team at a financial firm in Santa Monica. I was very fortunate; I found that I really enjoyed the work—I loved thinking about interesting, complex problems—I met wonderful mentors and sponsors who are very supportive and generous with their time and expertise, and I realized that I would be able to make a far greater impact in industry than I would in academia.

### *What kind of math do you do now?*

**UG:** The first few years of my career, I priced energy derivatives and credit instruments using stochastic calculus. Now, I mostly work on numerical optimization and portfolio construction. Even though I don't prove theorems anymore, I am still guided by rigorous thinking and strive to understand whether a certain hypothesis or conjecture is backed by real world data.

**MY:** I don't prove theorems anymore either, but I still get to do all the things I love about math—rigorous problem solving, spirited collaboration, and wading through large, complex data to build a deeper understanding of our world. There's a richness, a complexity to the problems, and there's the same joy of discovery.

### *What does a day in the life look like?*

**MY:** I have a hybrid researcher/portfolio manager role and devote about 75% of my time to research and 25% of my time to managing our Asia-Pacific portfolios.

The first 1–2 hours of most days are spent in research seminars or reading groups, where people share new work and receive feedback or discuss the latest academic research. After that, I work on research projects with my collaborators. Jointly, we draw on our backgrounds in mathematics, statistics, machine learning, computer science, economics,

and finance as we seek to uncover novel insights and advance our understanding of financial markets. In the afternoon, I sometimes try to slip away for a quick workout before preparing for Asia's market open.

We manage portfolios collaboratively. When it is my week on the rotation, I work with our traders and a number of other teams at BlackRock to execute our investment strategies.

**UG:** Since part of our team is in London, I try to be in the office by 8:00 am so that we can meet via video conference before the London folks go home. Outside of team meetings, I mostly work on our optimization software or on individual research projects. These days, I exclusively code in Python. But earlier in my career, I wrote code in C++, Java, MATLAB, SAS—you name it!

Occasionally, I also attend company-wide events, such as talks or panel discussions organized by various business groups or employee networks, such as the women's network and the LGBT+ & allies network.

These days, I go home around 6:00 pm and have dinner with my family. When my kids were younger, I typically left the office at 5:00 pm, sharp. But now my kids are in high school, so I have a lot more flexibility.

*What's some advice that you have found especially helpful?*

**MY:** Cultivate a personal board of directors comprised of people whose counsel you respect and who have diverse experiences, values, and beliefs. Lean on them; let them help you navigate difficult decisions and challenging situations.

*Do you have advice for young people who are interested in finance careers?*

**UG:** Make sure this is your passion! You will be much more successful and willing to go above and beyond if you are truly passionate about what you are doing. Also make sure you can code well; knowing statistics and applied mathematics also helps. You may be valued for your quantitative skills, but you should be able to convince people that you are interested in investing!

**MY:** There are so many different kinds of careers in quantitative finance, and there are so many different paths to each one. You will encounter opportunities you never could have imagined as a student. Be open to those. Invest in yourself; build a strong quantitative foundation (math, statistics, machine learning, and computer science), develop unparalleled expertise in and become exceptional at what you are working on right now, hone your communication skills, and keep learning.



Ursula Gritsch



Melissa Yeung

### Credits

Photo of Ursula Gritsch is courtesy of BlackRock.

Photo of Melissa Yeung is courtesy of the DOE Computational Science Graduate Fellowship Program.