CWM NEWSLETTER
ISSUE 10, DECEMBER 2023

Editorial To The Tenth Issue

Dear Readers,

Welcome to the 10th edition of he International Mathematical Union Committee for Women in Mathematics newsletter, marking a significant milestone in our journey of exploring the diverse and inspiring world of women in mathematics. In this issue, we are thrilled to continue our enlightening interview series, and this time, we have the pleasure of featuring Matilde Lalín, recently honored as an AWM Fellow. Join us as we delve into her remarkable journey and gain insights from her experiences.

We also bring you several exciting updates and achievements within the mathematical community. One standout announcement is the new CWM call for 2024. This call presents a funding opportunity for activities or initiatives to support women in mathematics taking place from February 2024 to February 2025. We encourage all members to explore the possibilities and actively participate in this forward-looking initiative.

As we traverse the pages of this issue, we wrap up with yet another captivating interview, this time with Constanza Rojas-Molina. Explore the captivating world of mathematics through her creative cartoons. Experience the unique perspective she adds, revealing the playful and uncharted side of mathematicians.

It's been five remarkable years since the inception of this newsletter. A half-decade filled with insightful interviews, groundbreaking news, and captivating stories has led us to this significant milestone issue. Our heartfelt thanks go out to our readers, contributors, and supporters who have accompanied us on this incredible journey. Here's to five years of empowering narratives, and to the anticipation of many more years ahead, celebrating the brilliance and resilience of women in mathematics.

Thank you for being part of our community.

Ekin Ozman

Interview with Matilde Lalín

We continue our interview series featuring CWM members and delighted to present professor Matilde Lalín from University of Montreal. A native of Buenos Aires, Lalín holds dual citizenship in Argentina and Canada. She earned her Ph.D. in 2005 from the University of Texas at Austin and held various postdoctoral positions at renowned institutions such as the Institute for Advanced Study and the Max Planck Institute for Mathematics. In 2007, she secured a faculty position as an assistant professor of mathematics at the University of Alberta. In 2010, she joined the Université de Montréal, where she earned tenure as an associate professor in 2012 and was later promoted to full professor in 2018. In 2022, Lalín received the Krieger–Nelson Prize from the Canadian Mathematical Society for her outstanding contributions to Number Theory. In 2023, she was named a Fellow of the American Mathematical Society for her significant work in number theory, particularly on L-functions, and for her service to the mathematical community. Recognizing her ongoing contributions, Lalín is set to become a fellow of the Association for Women in Mathematics in 2024, particularly for her leadership in the Women in Numbers Network, her service to the International Mathematics Union Committee for Women in Mathematics, and her efforts to make conferences more welcoming and accessible.

Q: Could you tell us how you got into math? What made you a mathematician? When did you decide to become a mathematician?

ML: I have been interested in science since I have a memory. For example, at 5 years old, growing up in Argentina, I wanted to be an astronomer. I went through wanting to be a biologist, a chemist, a physicist, and then finally at some point in my early teenage years, after being a very active participant in mathematical olympiads, I started thinking about becoming a mathematician. I really didn't know anything about research or teaching or mentoring, or any of the things that a professional mathematician actually does. I thought that being a mathematician meant solving math olympiad problems for the whole day. Mathematics was a natural, even obvious, choice when I started my studies at the University of Buenos Aires. Since then, becoming a mathematician has been a gradual process, always knowing the next step, but not necessarily knowing what that next step actually means. In a sense I'm still learning what it means to be a mathematician. As I progress in my career I find new responsibilities and challenges, many of them interesting.

Q: As a child or teenager, did you do math activities outside of school? Was there a pivotal moment when you knew you wanted to become a mathematician? You participated in the International Mathematical Olympiad (IMO). Did your participation in the IMO have a significant influence on your decision to become a mathematician?

ML: When I was 13 my mathematics teacher signed up my name for the Mathematical Olympiads and I fell in love with mathematics once and for all. Mathematical Olympiads provided a community of people full of energy and similar interests and I learned a lot from them. I credit Math Olympiads with teaching me what a proof actually is. The IMO itself was an incredible experience. It allowed me to travel to Turkey and to Canada, which for me, as a teenager coming from Argentina, were very remote places! And there I met so many incredible people from all around the world, with different cultures and languages, and yet, all united by their love

Argentinian team in the Iberoamerican Mathematical Olympiad, Fortaleza, Brazil 1994

of math and having many other common interests too. Little did I know that Canada would become my home more than 10 years later. I have met amazing people in Math Olympiads in Argentina, and several of them are among my closest friends for life. I'm not sure that there was a pivotal moment when I knew I wanted to become a mathematician. It was more like a natural path to follow. After having all these experiences, I just wanted more of that: more math, more interactions with people who love math, etc.

Q: Did you have any role models? (male or female?)

ML: In my Math Olympiad times my role models were the incredible teachers and professors that were coaching us from my high school (Estela Davila and Mirta Bleischmidt) and very particularly those that were involved with the teams of Argentina (Flora Gutierrez and Patricia Fauring). As a professional mathematician, I first had many role models among the professors I had as a student, and later among

Lalin's postdoctoral advisor David Boyd, her PhD supervisor Fernando Rodriguez-Villegas, and herself during the Niven lectures at UBC, 2007.

my colleagues, both in my institutions and from the Women in Numbers network. I'm going to name my PhD supervisor, Fernando Rodriguez-Villegas and my colleague, friend, and frequent collaborator Chantal David as my main role models, but there are many others.

Q:Can you tell us about your research? What attracted you to this area of mathematics?

ML: My area of research is Number Theory. Most of my work revolves around L-functions, which are functions that codify information about different arithmetic objects. For example, the Riemann zeta function is an L-function that codifies the distribution of prime numbers. I work with Mahler measure, a function on polynomials, which is related to special values of L-functions and contributes to the understanding of very general statements such as the Beilinson's conjectures and also has applications to Low-Dimensional Topology. I am also very interested in distribution questions around L-functions. For example, I have worked on moments of L-functions and used them (in collaboration with Chantal David and Alexandra Florea) to prove non-vanishing results for cubic L-functions. I was first attracted to number theory because of the simplicity of many of its problems and results. To me, asking questions about integer numbers is very natural, and in fact many people outside the area can understand the statements.

Q: Can you tell us about your teaching and other aspects of your career as a mathematician? What are the aspects you enjoy the most?

ML: The aspect of being a mathematician I enjoy the most is research, and in particular, collaborations. I like the way we can connect to other people while collaborating, and the

> "Mathematics is fun. If you enjoy it, you should not be afraid to engage with math! "

mentorship relations that get developed because of that. I particularly enjoy working with students of any level on research projects. I also enjoy traveling to conferences

and workshops, and being involved in projects that encourage the participation of women and other minorities in mathematics.

Q: Do you have PhD students ? How do you view the experience of being an advisor?

ML: I currently have two PhD students and another one who graduated last year. Having PhD students is both fun and hard at the same time. I find that there is a big responsibility in making sure that they succeed in their chosen careers. It is an amazing experience to see each student develop their research skills and become independent researchers. Other than PhD students, I have supervised ten master's theses and seven undergraduate honor theses. I have also supervised about 30 undergraduate students in summer research projects. I enjoy working with students very much.

Q: You are an award-winning, active researcher, you have many administrative duties and you are also an active member of many organizations. How do you balance all these?

ML: As I progress in my career I find that balancing administrative duties, teaching, and research is becoming more and more challenging. I am still learning how to say "no", but I am a bad student in this subject. I would certainly like an answer to this question, as I am completing this interview in the middle of the night.

Q: Have you faced any challenges as a woman in mathematics? If yes, did you have other kinds of support through these challenges, if any?

ML: I have faced different challenges as a woman in mathematics. Most of them are rather structural: the academic system naturally developed around a certain profile for a mathematician (or other academics) and, while times have brought evolution and welcomed changes, there is certain system inertia that is hard to overcome. My favorite current example has to do with sabbaticals and the expectation that one should outroot their whole family to live somewhere else for a year. This works for some families but does not work for others, and I suspect it affects women academics much more, but some institutions

Giving a lecture during the 50 Years of Number Theory and Random Matrix Theory Conference at IAS 2022.

Courtesy of Terry Busk and the American Institute of Mathematics"

seem to still ignore this issue. A much bigger challenge that I faced was the two-body problem. My husband is a physicist. We are fortunate that we are now both university professors in the same city, but it took several years of uncertainty before we reached this happy ending.

Q: Did you have any advance notions or concerns about how your family's growth would intersect with your career growth? How do you balance work and family life?

ML: I had general concerns, but I didn't know much. It turns out that balancing family and career is harder than what I had expected, but I was also happily surprised by my capacity to adapt and find creative solutions. My children are now 14 and 10 years old and things are easier, but when they were young, it was quite challenging to travel to conferences or find quality time to do research. I did what I could and learned to be much more productive than what I was before I had children. I was very lucky to end up in Quebec, the one Canadian province that has a system close to Universal Daycare. I don't know if I would have been able to manage this career with two young children otherwise. Finally, I have to admit that my work and family life balance took a big hit during the COVID times when the schools closed and everything went online, and I feel like it has not completely recovered since then.

Q: You are actively involved in various initiatives related to minorities in mathematics. Could you please share more about your involvement in these initiatives? You have participated in several Women in Numbers (WIN) conferences. Can you tell us a little about the Women in Number Theory network?

ML: The Women in Number Theory network is a mathematical research community whose goal is to support women doing research in number theory. It started with a collaborative workshop organized by Kristin Lauter, Rachel Pries, and Renate Scheidler in 2008, and it quickly evolved into a network that oversees

Michelle Manes, Chantal David, and Matilde Lalin during WIN2, a workshop that we co-organized at Banff 2007

the organization of regular workshops, conferences in cooperation, proceedings, special sessions, and an email list for exchanging of resources and news. As for the workshop themselves, participants are assigned to a research group and a project before the workshop, and a large part of the workshop time is spent with participants working in those groups. Those groups typically continue their projects after the workshop, and this often results in publications. The workshop provides an excellent opportunity for mentoring, networking, and research collaborations. I was fortunate to be a participant in the first workshop, and have been involved ever since: as a workshop organizer, as editor for some proceedings, and as group leader, several times. In addition to my involvement in the WIN network and the CWM, I was part of the Women in Mathematics committee of the Canadian Mathematical Society for several years, I served in some committees for the AWM, and I have been also part of some local EDI committees. I am proud to be a Latina and I occasionally collaborate with initiatives that involve students and researchers in Latin America.

Q: What advice would you give to a beginning male or female graduate student/ early career researcher in mathematics?

ML: To graduate students: your first focus should be on being the expert in your problem/specific area. Once you are there, you should try to expand your horizons. To postdocs and early career researchers: try to get involved in some research collaborations (but not too many, you don't want to stretch yourself too thin). Collaborating with others gives you a great opportunity to learn subjects out of your comfort zone. If you're in a collaboration and you don't know something, don't panic, just try to use the opportunity to learn and catch up with your collaborators.

Q: Do you have advice for young people who might be thinking about doing math?

ML: Mathematics is fun. If you enjoy it, you should not be afraid to engage with math!

You can read the old issues and subscribe the CWM newsletter here.

https://www.mathunion.org/cwm/about/cwm-newsletter

NEWS FROM CWM

CWM 2024 Call is Now Open!

The CWM invites proposals for funding of up to €3000 for activities or initiatives to support women in mathematics taking place from February 2024 to February 2025. Applications should be submitted by **January 05, 2024**, via the IMU dedicated webform. They should aim at one of the following:

- Establishing or supporting networks for women in mathematics, preferably at the continental or regional level;
- Organizing research workshops geared towards establishing research networks for women in mathematics;
- Other ideas for researching and/or addressing issues encountered by women in mathematics.

This will be the only call for applications regarding activities in 2024. Successful applicants will be informed no later than February 16, 2024.

For more information, please read the call here. Instructions on how to submit a proposal via the the IMU dedicated webform can be found here.

Currently Funded Activities by CWM

In 2023, CWM selected 11 initiatives to be funded through its annual call. Some of the selected projects consist of continental meetings for women in mathematics:

- The 1st meeting of the Asian and Oceanian Women in Mathematics (AOWM), which took place in Bangalore, India, on April 24-28, 2023.
- The 3rd Meeting for Latin American Women in Mathematics, which took place in Tunja, Colombia, on June 2-4, 2023.
- The Southeast Asian Women Mathematicians Meeting, which took place in Yogyakarta, Indonesia, on July 26, 2023.

CWM also supported the following research workshops for women in mathematics:

- Women in Sage - Uganda, which took place on September 4-8, 2023, in Kampala, Uganda.

- Matemáticas en el Cono Sur 2, the second edition of a research workshop geared towards establishing research networks for women in South America. The final face to face workshop will take place in Montevideo, Uruguay, in February 2024.

The following networking activities for women in mathematics were also funded:
- The Women of Nepal in Mathematical Sciences (WoNiMS) Annual Conference, which took place in Kathmandu, Nepal, on November 3-5, 2023.
- Activities of the collective Indian Women and Mathematics (IWM) during 2023.
- The networking project "Breaking Barriers to Women and Girls in Mathematics through Networking, Collaboration and Mentorship in Sub-Saharan Africa", which involved three universities in Nigeria and one in Uganda.
- The May 12 initiative - Celebrating Women in Mathematics.

Two of the events that were originally planned for 2023 have been postponed to the beginning of 2024:
- A network meeting organized by the Commission of African Women in Mathematics of the African Mathematical Union (AMU-CAWM), which will take place in Casablanca, Morocco, on March 4-8, 2024.
- A networking activity for women in mathematics within the ZIGZAG School of Physics and Mathematics without Frontiers, which will take place in La Habana, Cuba, on March 11-23, 2024.

SCGES Third Annual Report Published

STANDING COMMITTEE FOR GENDER EQUALITY IN SCIENCE

THIRD ANNUAL REPORT

The Standing Committee for Gender Equality in Science (SCGES) is an independent committee formed in 2020 by several international scientific organizations, including the IMU. These founding partners had worked together on the project A Global Approach to the Gender Gap in Mathematical, Computing, and Natural Sciences: How to Measure It, How to Reduce It? , which became known as the "Gender Gap in Science Project". The main goal of the project was to produce sound data about gender gap in science to support the choices of interventions that scientific unions could feasibly undertake. In 2020, the Gender Gap in Science Book was published, presenting the methodology, results, activities and recommendations of the project. The SCGES was formed as a follow-up to this project. Its aim is to ensure liaison amongst international scientific unions to

foster gender equality and the implementation of recommendations of the "Gender Gap in Science Project". The SCGES third Annual Report has just been published and can be found on the SCGES website.

Professor Caroline Series awarded a CBE for her services to mathematics

CWM congratulates its former vice-chair, Professor Caroline Series, for being awarded a CBE for her services to mathematics. Professor Series was the third female president of the London Mathematical Society (LMS), holding the post from 2017 to 2019. She was also a founding member of European Women in Mathematics, and was CWM first vice-chair from 2015 to 2017. More information can be found here.

OTHER NEWS AND ANNOUNCEMENTS

- Sydney Mathematical Research Institute (SMRI) International Visitor Program (IVP) application

The Sydney Mathematical Research Institute's International Visitor Program offers an enriching experience for fellow mathematical scientists, fostering collaboration on a global scale. This visitor program serves to connect mathematicians from diverse corners of the world to engage in meaningful discussion, exchange knowledge and ideas, and establish lasting connections with researchers in Australia.

The next IVP round will open in mid-December, and the application form will be posted on this page, at that time.

- 2024 AWM Awards and Prizes at the Joint Prize Session of JMM

The Association for Women in Mathematics (AWM) will present AWM Prizes and Awards during the Joint Prize Session of the JMM in San Francisco, scheduled for January 3-6, 2024.

- The 2024 Louise Hay Award for Contributions to Mathematics Education will be presented to Trena Wilkerson, Professor and Interim Chair in the Department of Curriculum & Instruction in the School of Education at Baylor University. She is being honored for her leadership at the national, state, and local levels in

mathematics education, her transformational teaching and mentorship, and her global initiatives and programs. Here is the press release.

- The recipient of the 2024 AWM Sadosky Research Prize in Analysis will be Robin Neumayer, Assistant Professor at Carnegie Mellon University. Neumayer is for outstanding contributions to Calculus of Variations, Partial Differential Equations, and Geometric Analysis. Here is the press release.

- The recipient of the 2024 M. Gweneth Humphreys Award will be Cristina Villalobos, Myles and Sylvia Aaronson Endowed Professor, School of Mathematical and Statistical Sciences, University of Texas Rio Grande Valley (UTRGV), for her exceptional success in mentoring and its subsequent impact on the mathematical profession as a whole. Here is the press release.

- The recipient of the 2024 AWM Research Prize in Algebra and Number Theory will be Yunqing Tang, Assistant Professor at UC Berkeley. Tang is recognized for her breakthrough work in arithmetic geometry, including results on the Grothendieck-Katz p-curvature conjecture, a conjecture of Ogus on algebraicity of cycles, arithmetic intersection theory, and the unbounded denominators conjecture of Atkin and Swinnerton-Dyer. Here is the press release.

- The 2024 Alice T. Schafer Prize for Excellence in Mathematics will be awarded to Zoë Batterman, a senior mathematics and statistics major at Pomona College and Arianna Meenakshi McNamara, a senior mathematics and physics major at Purdue University. Mattie Ji, a senior at Brown University majoring in Mathematics-Computer Science and Applied Mathematics has been named as Runner-up. Here is the press release.

- The 2024 AWM Dissertation Prizes will be presented to Abigail Hickok and Parvathi M. Kooloth. The AWM Dissertation Prize was established in 2016, an annual award recognizing exceptional work in a dissertation defended in the last 24 months. The award is intended to be based entirely on the dissertation itself, not on other work of the individual. Here is the press release.

- **The event "Diversity in Finite Fields and Coding Theory" is receiving applications.**

The workshop "Diversity in Finite Fields and Coding Theory" will take place on July 07 - 12, 2024, at IMPA, Rio de Janeiro, Brazil. It will bring together women and underrepresented minorities in mathematics to carry out joint research on Finite Fields and Coding Theory. The workshop is now receiving applications to select participants. The target audience is composed of PhD students, postdocs and researchers from underrepresented groups. The deadline is January 15, 2024. More information can be found here.

Interview with Constanza Rojas-Molina about her work as cartoonist of mathematicians

Constanza Rojas-Molina is a mathematician and an illustrator. She had a very significant contribution to (WM)² 2022, the virtual World Meeting for Women in Mathematics through two beautiful portraits of women mathematicians (Yulia Zdanovska and Olga Alexandrovna Ladyzhenskaya) and her full interview will appear in the (WM)² Proceedings under preparation. We are happy to present an extract of her interview by Marie-Françoise Roy.

Can you tell us something about you? How early did you start to draw ? Did you draw in all periods of your life ? When did you choose to study math and become a researcher?

CRM: Since I can remember I was always drawing and drawing everything that I saw around me. When I was at school, I was a good student, mostly because I was very curious, and I loved reading and drawing, but mathematics did not play any role. I come from a family of teachers, my mom, my uncle and my sister are teachers, and observing them, I could tell mathematics was useful but I was not particularly interested in math. I was more interested in history, archeology, and comics. But later, when I was in high school, I had my first chemistry and physics courses and things changed. In Chile, in the years before high school all science courses are mixed, but in high school you can choose more specific courses. I loved the chemistry and physics courses, this is where I learnt about atoms and electrons, so when I had to decide which university program to apply to, I wanted something to do with this. I picked physics. There, I also had math courses, and it was there that I discovered university math. For me it was a real revelation, compared to what I had before at school. I found it fascinating. So much that after two years in the physics program I switched to math, and got a bachelor degree in math.

At that moment were you still drawing, like inventing some graphic novel ? Or just drawing people in your environment ?

CRM: Until I finished high school I was drawing all the time. I was making my own short comics, making up characters, and drawing stuff from my life. And then something weird happened when I went to university. I suddenly stopped drawing. Why? I think that maybe all my creative energy just went into my studies. I was working hard, and I really liked the topic of my studies. It was like having a creative blocking in the illustration part, while I was focusing on studying physics and math. At some point in high school, I had to decide about pursuing a career. If I liked drawing so much why not study illustration? The thing is, I come from a middle-class family and the career of art was not seen as a stable activity, an activity that will make you independent. So, my family was very smart to very subtly persuade me not to do art. My whole environment would give me the message "You can always have art as a hobby, you can always draw doing something else..." I needed to have a job that would make me independent. That's why I did not pursue arts. But I had so many interests that it was hard to choose and easy to deviate from art. When I discovered physics, I was so fascinated by this that I thought OK this is what I'm going to do. And then math got in the way.

What kind of math did you like better ? Nowadays your research is in mathematical physics related to probability, right ?

CRM: While doing my undergrad I got interested in operator theory, partial differential equations with a link to quantum mechanics. Then I moved to Paris for the Master 2 at Université Pierre et Marie Curie and did a master in fundamental math, still focused on analysis and operator theory. During my master thesis in Paris I worked on random Schrödinger operators, and I continued working on this topic during my PhD with François Germinet at the university of Cergy-Pontoise. Random Schrödinger operators are a way to study the propagation of electrons in a medium with impurities which are modeled via a random process. It is a beautiful theory that combines analysis, probability, dynamical systems, and physics. I find it connects with other disciplines and this is what makes it interesting. It's a good combination of maths and physics.

So you did not give up physics, you went into mathematics but your fascination for physics is still there.

CRM: Yes. I have my little physics heart but I do math. I also think that my leaving physics was due to the way it was taught to me at the university. Physicists would

talk about intuition, and I did not have any. For me, intuition was like magic. It felt I had to follow recipes without understanding what I was doing. And in mathematics it is the opposite. You really have to understand what you are doing, so for me, math is much more transparent, and I like that. It is very honest.

You practice simultaneously mathematical research as well as teaching at the university and graphical creation, how do you get organized to do that? What proportion of your time/mental energy/creativity for these two types?   You already said that when you were studying you had to focus on science and stopped drawing; so what is the situation now?

CRM: I would love to be able to say that I do both in parallel but this is not how it works for me. It took me a while to realize this, but I have periods where I focus more on research, and I leave the illustration side and periods when I focus more on illustration and leave the math research aside. Teaching, on the other hand, is a constant presence, because of the regular and unavoidable schedule. So, while I accelerate on one activity, illustration or math, I go slower on the other. I cannot split my attention because it is the same kind of energy that goes in them. When I work on illustration, it occupies a lot of space in my mind. I need time to reflect, to come up with ideas. It is exactly the same process as math research. There are people who tell you, you have to do math everyday, and in art, people tell you, you have to practice everyday. And it is true, but for me, I can't do both because I get obsessed by a topic, and all the time I have is occupied by it. Of course, I keep the other one activity going but doing things that require less energy. For me, math and illustration are very similar activities.

You create portraits of women in mathematics which are also a scientific description of their work. With whom did you start and how do you proceed? Was it your initiative or was it a command ? How is it working ?

CRM: This was by my own initiative. I started doing these portraits in 2013 for my blog ("The RAGE of the Blackboard"), which was the outreach part of my Marie Curie Intra-European Fellowship in Germany. It was a playground where I could develop skills like writing, interviewing taking advantage to touch some topics in academia because I was starting to navigate the that world as a professional and had many questions. For this, I started interviewing senior women mathematicians. I wanted to know how they had survived or succeeded navigating academia. Besides that, I wanted to do illustrations to go with the interviews. That's how I came to make portraits of people with a visualization of their research, or other aspects of their lives. Whenever I would interview someone, I would look at some of their articles, try

to understand a bit of that they did in order to have an idea and draw it. You know, how artists are always associated to their paintings, well, I wanted to show mathematicians with their maths (what I understand of it!). I do not write in the blog anymore because it is very time consuming, and I have less time now, but I continue doing portraits of people and their work.

You explained how as a post doc, you want to learn from more senior women how they survived and portraying them was part of the process. Did you portrait men mathematicians too?

CRM: I do mostly portraits of women mathematicians but I've done a few portraits of male scientists. For my book "La gran Aventura del conocimiento", written in collaboration with mathematician and science communicator Leslie Jimenez Palma, I drew some male scientists. More recently, I did a portrait of Georgi Raikov a very dear Bulgarian mathematician who worked in Chile for many years and contributed to the development of spectral theory in Chile.

Do these women mathematicians you portrait have special connection with you ?

CRM: They touched me in some way. It started from the people I interviewed in my blog, and then at some point when Maryam Mirzakhani died I did her portrait. As the rest of the mathematical community, I was very saddened by the news. I had no relation to her or her math, but her influence, the impact of her work and the legacy she left was enough to move me.

How long does it take you to create such a portrait ? Did you ever get paid for your graphical work?

CRM: I am a professional illustrator. I do get paid for some of my graphical work. But not for these portraits. I do them because I like them. It takes me many hours to draw and it also takes me a lot of time, maybe a week, because I think and read a lot of material related to their work. I do not work on it eight hours a day, I need to let it simmer.

There was during the fall 2023 an exhibition about Emmy Noether in the Institut Henri Poincaré (IHP) library to which you contributed. What was your role in this project?

CRM: I contributed with illustrations.

Did they ask you for the IHP exhibition?

CRM: Clotilde Fermanian Kammerer asked me, she was in the scientific committee and asked me to join because I had already done a lot of research about Noether's life in order to draw her in my blog Noethember. But at the end Clotilde did all the documentation work and I just did the illustrations. I took some illustrations that I already had and discussed them with Clotilde and then I made better ones.

Can you tell us about this "Noethember blog"?

CRM: Noethember was my own initiative, a personal project. I was in Germany in 2018, and wanted to do a drawing challenge to push myself to draw more every day, which is always hard to do but necessary in any kind of creative practice. This kind of creative challenge is common in social media, and the most common one in illustration is called "Inktober", because it's about ink drawings done during October. I needed a topic for the drawing challenge, and I wanted to take advantage of this activity to learn something new.

#Noethember Day 14

"Alfred Ackermann-Teubner Memorial Award for the promotion of the mathematical sciences"

1932 International Congress of mathematicians Zürich

#Noethember Day 15

1933 Hitler is appointed Chancellor of Germany

Since I was in Germany, I thought of doing something around Emmy Noether, who has several things named after her there. So, I started a drawing challenge in November about Emmy Noether, naturally calling it Noethember (Noether + November) and people from the blog The Aperiodical liked the idea so much that they supported me by promoting the activity and hosting articles about it. It was a great activity, and still today, I commemorate Noethember with an activity about Emmy Noether.
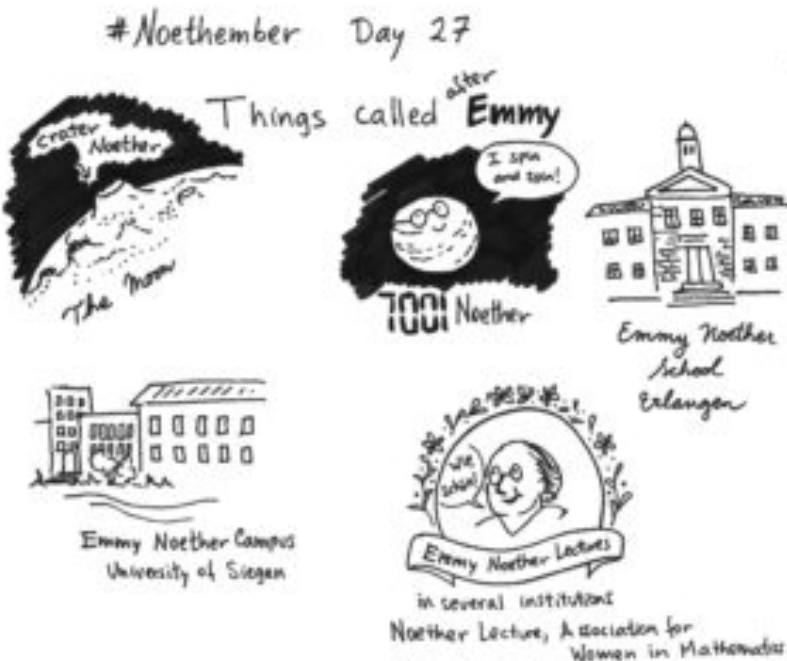
How was it?

CRM: During one month I drew about Emmy Noether. I was drawing just with ink and paper, in a spontaneous way. It would take me less than 30 minutes to draw it. No sketch, no draft, just from my head directly to the pen.

I wanted to do this graphical exercise but I also wanted to learn. As I already said, I was trained in physics, not in abstract mathematics at the beginning of the university. So I never heard about Noether's theorems at the university. I knew she was very famous and important but I did not know much about this lady. It was a good opportunity to learn about her. I discovered her ways of doing math and research, which are very interesting, and good lessons also for modern times.

Can you give example of these lessons?

CRM: She wasn't in a hurry to write papers, she was much more interested

in ideas, and discussing them with people. These people would later go on and write articles based on her ideas. She liked walking with her students, discussing math. She had the time to walk and talk maths. These remain relevant ideas for nowadays. I like to do these portraits when I learn something from them.
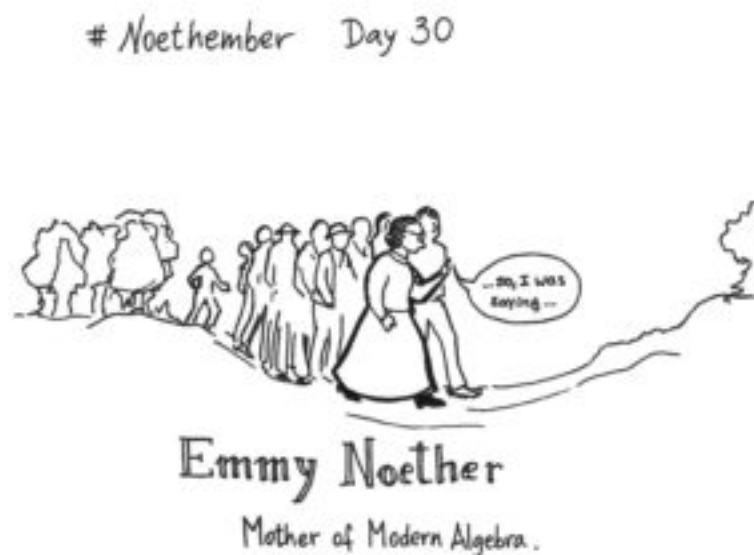
What are the other projects for popularizing mathematics, in France or Chile or elsewhere you are involved with? Do you have big projects in that direction?

CRM: I mentioned before I published a book in Chile and I would like to translate it. But at the moment I am working on a comic with a Mexican colleague who works in Chile. Hopefully it should be ready by the end of the year.

Is your coauthor a comic designer or a scientist?

CRM: He is a mathematician and a writer, he writes theater plays. He wrote the script for the comic and I am drawing. I like working with him because he allows me to give ideas. I am not an illustrator for hire, where the script writer would tell me "this is the story" and I just draw it. I only like processes where I can actually contribute.

Can you say something about the topic of the comic, is it mathematics?

CRM: It is a comic about the Collatz, or Syracuse Conjecture. Start with any natural number and repeat the following operation: divide the number by 2 when it is even and multiply it by 3 and add 1 when it is odd. The conjecture says that you get a sequence of numbers that always ends repeating the orbit 4,2,1. This is an open question, and an excuse to talk about conjecture, theorems, counter-examples and how people do mathematics.

Do you have characters like in a graphical novel or is it more abstract?

CRM: There are characters!

Thanks for answering our questions. It was truly fascinating.

Don't forget to visit our web page regularly for more news and information!
https://www.mathunion.org/cwm