

Katrin Wehrheim (1974 – Present)

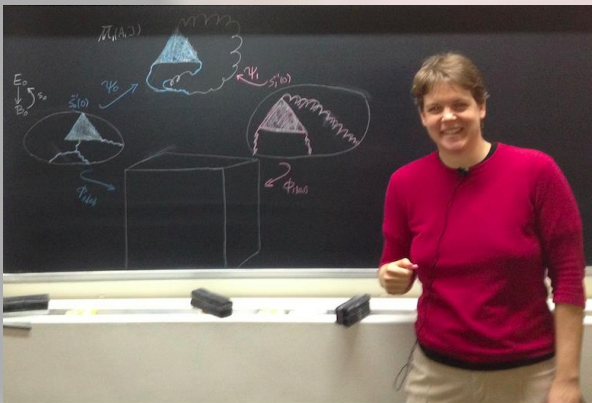
LGBTQ mathematician and activist

“It's important for LGBT people to be proud and visible not just for themselves, but [...] to show the next generation that [...] it's still possible to do math.”



Wehrheim came out as gay at the MIT women's maths conference and has promoted and encouraged increased visibility for women and the queer community in academic settings, with a focus on STEM.

“We don't write good papers anymore [...] someone with less training will have no way of following it without having to find the route for themselves.”



Katrin Wehrheim was born in 1974 in Germany and currently works at the University of California, Berkeley. Their main interests are symplectic topology and gauge theory and they are known for work on pseudoholomorphic quilts. They studied at the University of Hamburg and Imperial College, and then proceeded to complete their PhD at ETH Zurich in 2002. Their thesis in mathematics won the 2002 ETH medal. They were an Instructor at Princeton University, before taking a tenure-track position at MIT, where they became the co-head of the 2008 Celebration of Women in Mathematics.

Due to their attention to detail, Katrin is brilliant at spotting fatal flaws in mathematical communication within published papers. They suggest that mathematicians need to provide full details as well as give an expository description of the idea of the proof to make papers more accessible to aspiring mathematicians from diverse backgrounds, thus enabling future students to approach the proof themselves. This will help bridge the gap by providing different cultures of thinking and producing an educational climate in which communication and clarity are valued higher.

‘If I'm not in the office ... check the nearest lake or mountain’ – Katrin also has an active life outside of academia, enjoying climbing and rowing. They are also happy for people to contact them to ‘chat about queer life in academia’ or to ‘hear [their] own story’.



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browse
Katrin's
website

Katrin has also been the recipient of many prestigious awards, such as the 2010 Presidential Early Career Award for Scientists and Engineers from Barack Obama, and the 2009 National Science Foundation CAREER award whose educational component helps fund many activities at MIT for women in mathematics.

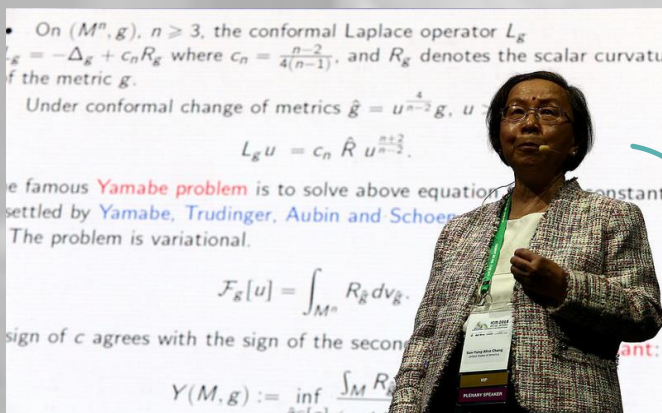
Sun-Yung Alice Chang (1948 – Present)

Taiwanese – American mathematician

“I can personally testify to the importance of having role models and the companionship of other women colleagues.”



“In the mathematical community, we should leave room for people who want to do work in their own way. Mathematical research is not just a scientific approach; the nature of mathematics is sometimes close to that of art”



Since 1980, Chang has held professorships between the University of California and Princeton. Between 1991 and 1994, she served on the selection committee for the Noether Lectures of the Association for women in mathematics.

Sun-Yung Alice Chang, born in China in 1948, is a mathematician known for her work on geometric type partial differential equations and spectral geometry. At a young age, Chan moved with her family to the Republic of China in Taiwan during the Communist revolution in mainland. She recalls her family's financial difficulties when they had to start from ground zero in post WW2 Taiwan. Her mother became an accountant, and had to learn the trade on the job, to support her husband's income. Chang completed her education and undergraduate degree in Taiwan at NTU, where she was amongst only six other women. She then completed her Ph.D. in 1974 at the University of California, Berkeley.

Chang's most notable work, done in collaboration with her husband Paul Yang, focused on extremal functions of Sobolev inequalities to solve PDEs of curves on a sphere, and applications of this to compactness and metrics to 3-manifolds. Despite her work on problems about geometry, she considers herself to be an analyst first and a geometer second because of her background and the way she thinks about mathematics.

‘Girls Who Fell in Love with Math’ – A documentary following the story of two girls, one being Sun-Yung Alice Chang, who grew up together in Taiwan in a time in which women's career choices were limited by societal expectations, but they defeated all odds and successfully pursued mathematics.



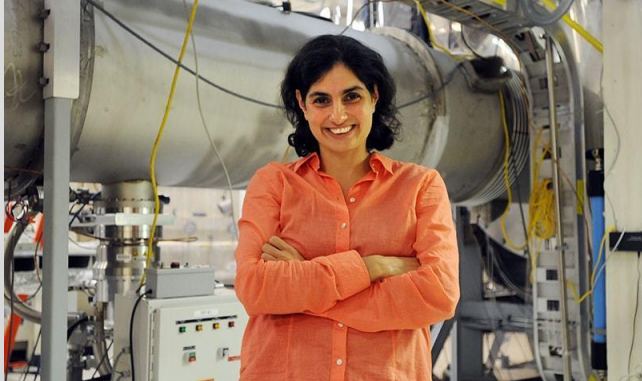
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interview
with Chang

One of Chang's greatest honours was the award of the 1995 Ruth Lyttle Satter Prize in Mathematics. Every two years, the prize is awarded to a woman who has made an outstanding contribution to mathematics research in the previous five years. In June 2009, Chang was one of the organisers of '2009 the Program for Women and Mathematics' held at the Institute for Advanced Study at Princeton.

Nergis Mavalvala (1968 – Present)

Pakistani-American astrophysicist

“Anybody should be able to succeed, whether you’re a woman, a religious minority or whether you’re gay. [...] And I am proof of that because I am all those things.”



“I am the type of person who does not notice barriers. So, if there are any, I tend to walk right through without noticing I crashed into one”



Mavalvala has been the recipient of countless awards. Most notably she received the MacArthur Genius Award on 2010 and was LGBTQ Scientist of the Year in 2014. She joined the faculty at MIT in 2002 and was the first woman to be named Dean of Sciences there in 2020.

Nergis Mavalvala is a Pakistani physicist known for her leading work in the discovery of gravitational waves. Her Ph.D. work solved the problem of how to precisely align mirrors less than a meter wide separated by four kilometers. This method is implemented today in Laser Interferometer Gravitational Wave Observatory (LIGO), which was the first to directly detect gravitational waves from colliding black holes in 2015. She began working in the field well before most people had heard of gravitational waves and her work has been an integral part of an international collaboration of thousands of scientists. In 2014, Mavalvala and her group were working on the quantum technologies being implemented in the Advanced LIGO system.

How was the LIGO system validated?

After the first detection of gravitational waves in 2015, the group did not immediately celebrate but were instead busy testing the validity of the computer algorithms. Through rigorous validation processes, the group was able to prove that detected gravitational waves were real and not artefacts of noise or other errors in the system, making the first detection of gravitational waves a landmark discovery in physics.

‘Integrity’ – the quality of being honest and having strong moral principles, and something Mavalvala hopes that the future generation of scientists will live by. She is proudest of her students when they collaborate and are kind dignified citizens.



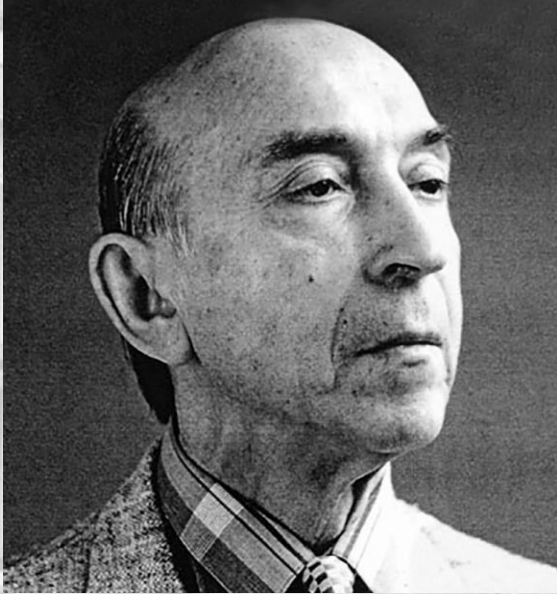
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Nergis'
interview

Mavalvala was born in Lahore, but primarily raised in Karachi, Pakistan. In 1986 she moved to the United States and enrolled at Wellesley College. She grew up in a ‘family where stereotypical gender roles were not really observed’, giving her the confidence that anything is achievable regardless of gender. She states that she was not aware of her sexual orientation until after college.

Lotfi Aliasker Zadeh (1921 – 2017)

Father of 'Fuzzy Logic'

“The question really isn't whether I'm American, Russian, Iranian, Azerbaijani, or anything else. I've been shaped by all these people and cultures, and I feel quite comfortable among all of them.”



Lotfi Zadeh was a pioneering computer scientist and mathematician, best known for founding fuzzy logic. Born in Azerbaijan and raised in Iran, Zadeh later moved to the United States, where he became a professor at UC Berkeley. His revolutionary work in fuzzy logic transformed fields like artificial intelligence, control systems, and robotics. Throughout his career, Zadeh received multiple awards, including the IEEE Medal of Honor recognising his profound impact on modern technology and computational theory.

Fuzzy Logic - a way of thinking that allows computers to handle reasoning that isn't just "black or white" or "true or false." Unlike traditional logic, which deals with exact values, fuzzy logic deals with uncertainty and can express concepts in degrees. For example, instead of just saying something is either hot or cold, fuzzy logic can say it is somewhat hot or a little cold, using values between 0 and 1 to represent these transitional states.

1973 - Elected to the US National Academy of Engineering

1991 - Awarded the Honda Prize for his contributions to science and technology

1992 - Awarded the IEEE Education Medal for his impact on engineering education

1993 - Awarded the IEEE Richard W. Hamming Medal for contributions to information science and systems

1995 - Awarded the IEEE Medal of Honour (highest award of the IEEE) for 'Fuzzy Logic'

1997 - Awarded the CIF Prize from the Italian Institute of Statistics for contributions to computational intelligence

2009 - Awarded the Benjamin Franklin Medal in electrical engineering by the Franklin Institute for 'Fuzzy Logic'

2012 - Awarded the BBVA Foundation Frontiers of Knowledge Award in Information and Communication Technologies for 'Fuzzy Logic'

“I can't say that anything has been "exciting". Rather, I would choose the word "interesting". Not too long ago, the Chinese University of Hong Kong conducted a survey to determine which consumer products were using Fuzzy Logic. The result was a thick report, some 150-200 pages long- washing machines, camcorders, microwave ovens, etc. What interested me wasn't the particular applications so much as the breadth of applications-so many products were incorporating Fuzzy Logic.”



←
Scan to watch an
interview!



Ron Buckmire (1968 – Present)

LGBTQ+ Advocate and fluid dynamics specialist

“I do my best to try and counter this idea that some people can do math, and some [can’t]. That’s just not true. Math is for solving problems. Math is for everyone. Math is done by people.”



Buckmire’s research is not just on mathematics, but also on diversity and inclusion. Buckmire’s work focuses on Taylor expansion and boundary value problems. These have profound impacts on fluid dynamics and thermodynamics. He has also published many papers focusing on the involvement of the LGBTQ+ community in higher education.

In 2023, he became the first openly gay and the fourth Black mathematician to be named a Fellow of the Society for Industrial and Applied Mathematics (SIAM).

Ron Buckmire is a mathematician, educator, and advocate for diversity in STEM. Originally from Grenada, Buckmire moved to the U.S. to pursue higher education and earned his Ph.D. in applied mathematics from Rensselaer Polytechnic Institute. He is known for his contributions to mathematical modelling, particularly in fluid dynamics and applied mathematics. In addition to his academic work, Buckmire is a passionate advocate for LGBTQ+ rights and underrepresented groups in STEM. He serves as a professor at Occidental College, where he has been a leader in promoting inclusivity within the institution. He also works extensively with national organisations, including the Mathematical Association of America (MAA) and has been recognized for his efforts to promote equity and access in mathematics.

Born in Grenada, Ron Buckmire began his academic journey at Presentation Brothers' College (PBC) in St. George's, where he first developed his passion for mathematics. After excelling in his secondary education, he moved to the United States to pursue higher studies. At Rensselaer Polytechnic Institute (RPI), Buckmire earned a Bachelor of Science in Mathematics in 1988, followed by a Master of Science in Applied Mathematics in 1991. His commitment to mastering mathematical theory and its real-world applications culminated in a Ph.D. in Applied Mathematics in 1995, where he specialised in mathematical modelling and fluid dynamics. Buckmire’s educational path reflects not just academic excellence, but also a deep curiosity and drive to apply his knowledge in ways that will have a lasting impact, both in mathematics and in creating a more inclusive academic world.



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Scan to read Buckmire’s paper on developments in undergraduate mathematics