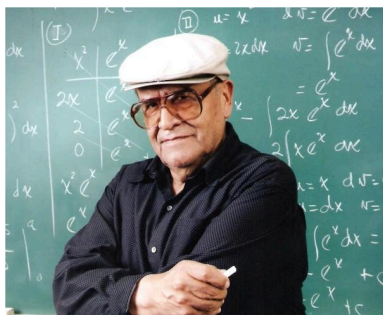


Some of our favorite Mathematicians & Computer Scientists....

Jaime Escalante



Jaime Alfonso Escalante Gutiérrez was a celebrated Bolivian teacher and one of the most famous educators in America during the 1980s and 1990s. He began teaching mathematics to troubled students in a Los Angeles school and became famous for leading many of them to pass the advanced placement calculus test. Born to teacher parents, he realized that his true passion was teaching and following in their footsteps, he became an educator as well. Later, he left Bolivia in search of a better life but upon arriving in America, he learned that his teaching credentials were not sufficient to teach there. So he earned another bachelor's degree plus an American teaching certificate in order to become an educator. As

a teacher, he strove to bring his kids to their full potential, working with them to help them understand mathematics. He is best remembered as the mathematics teacher at Garfield High School who led a group of students to excel at complex subjects such as advanced algebra, trigonometry, and calculus. A group of his students passed the advanced placement exam in calculus for the first time in the history of the school—one of his greatest achievements as a teacher. He saw the potential in his students that other teachers had failed to see before, and pushed them to amazing heights. ([Reference](#))

Maryam Mirzakhani



Maryam Mirzakhani was an Iranian mathematician and a professor of mathematics at Stanford University. Her research topics included Teichmüller theory, hyperbolic geometry, ergodic theory, and symplectic geometry. In 2005, as a result of her research, she was honored in Popular Science's fourth annual "Brilliant 10" in which she was acknowledged as one of the top 10 young minds who have pushed their fields in innovative directions.

On August 13, 2014, Mirzakhani was honored with the Fields Medal, the most prestigious award in mathematics. Thus, she became both the first, and to date, the only woman and the first Iranian to be honored with the award. The award committee cited her work in "the dynamics and geometry of Riemann surfaces and their moduli spaces". On July 14th, 2017, Mirzakhani died of breast cancer at the age of 40. ([Reference](#))

John Urschel



John Cameron Urschel is a Canadian-American mathematician and retired professional American football guard and center. He played college football at Penn State and was drafted by the Baltimore Ravens in the fifth round of the 2014 NFL Draft. Urschel played three seasons in the NFL. Urschel has bachelor's and master's degrees in mathematics from Penn State. He has published peer-reviewed articles in mathematics and is an advanced stats columnist for The Players' Tribune.

While a Penn State undergraduate, Urschel was involved in teaching integral vector calculus, trigonometry and analytic geometry, and introduction to econometrics. In

2015, Urschel co-authored a paper in the *Journal of Computational Mathematics*. Urschel began a Ph.D. in mathematics at MIT in 2016, focusing on [spectral graph theory](#), [numerical linear algebra](#), and [machine learning](#). MIT does not allow Ph.D. students to study part-time; while the Ravens knew that he was taking classes, Urschel admitted after retiring from the team that he did not disclose that he was a full-time graduate student. During the 2016 NFL season, after a home game Urschel studied from 5:30pm Sunday to Tuesday 11am when football practice began, taking [correspondence classes](#). On January 4, 2017, Urschel was named to Forbes' "30 Under 30" list of outstanding young scientists. His Forbes biography states "Urschel has published six peer-reviewed mathematics papers to date and has three more ready for review. That's a respectable publication history for someone who only started pursuing their PhD at MIT this year. He's won academic awards for his math prowess. All this while playing guard for the Baltimore Ravens." ([Reference](#))

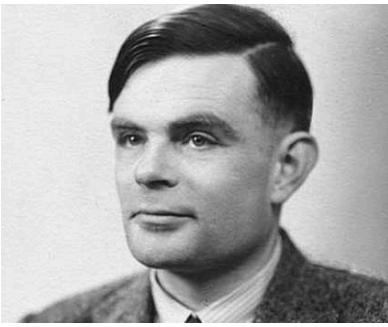
Eugenia Cheng



Dr Eugenia Cheng is a mathematician, educator, author, public speaker, columnist, concert pianist and artist. She is Scientist In Residence at the School of the Art Institute of Chicago. She won tenure in Pure Mathematics at the University of Sheffield, UK and is now Honorary Visiting Fellow at City, University of London. She has previously taught at the Universities of Cambridge, Chicago and Nice and holds a PhD in pure mathematics from the University of Cambridge. Alongside her research in Category Theory and undergraduate teaching her aim is to rid the world of "math phobia". Her first popular math book, *How to Bake Pi*, was published by Profile (UK)/Basic Books (US) in 2015 to widespread acclaim including from the New York Times, National Geographic, Scientific American, and she was interviewed around the world including on the BBC, NPR and The Late Show with Stephen Colbert. Eugenia was an early pioneer of math on YouTube

and her videos have been viewed around 15 million times to date. Her next popular math book, *Beyond Infinity* was published in 2017 and was shortlisted for the Royal Society Insight Investment Science Book Prize 2017, and *The Art of Logic* was published by Profile and Basic Books in 2018. She also writes the *Everyday Math* column for the Wall Street Journal, and has completed mathematical art commissions for Hotel EMC2, 6018 North, the Lubeznik Center and the Cultural Center, Chicago. She is the founder of the Liederstube, an intimate oasis for art song based in Chicago.. ([Reference](#))

Alan Turing



Alan Turing was an English mathematician, computer scientist, logician, cryptanalyst, philosopher, and theoretical biologist. Turing was highly influential in the development of theoretical computer science, providing a formalisation of the concepts of algorithm and computation with the Turing machine, which can be considered a model of a general-purpose computer. Turing is widely considered to be the father of theoretical computer science and artificial intelligence. During the Second World War, Turing worked for the Government Code and Cypher School at Bletchley Park, focusing on German naval cryptanalysis. Here, he devised a number of techniques for speeding the breaking of German ciphers and finding settings for the Enigma machine.

Turing played a crucial role in cracking intercepted coded messages that enabled the Allies to defeat the Nazis in many crucial engagements, including the Battle of the Atlantic. Professor Jack Copeland has estimated that this work shortened the war in Europe by more than two years and saved over 14 million lives. After the war, Turing worked at the National Physical Laboratory, where he designed the Automatic Computing Engine. The Automatic Computing Engine was one of the first designs for a stored-program computer. Despite these accomplishments, he was never fully recognised in his home country during his lifetime because much of his work was covered by the Official Secrets Act. Turing was prosecuted in 1952 for homosexual acts which were considered a criminal offence in the UK at the time. In 2009, British Prime Minister Gordon Brown made an official public apology on behalf of the British government for "the appalling way he was treated". Queen Elizabeth II granted Turing a posthumous pardon in 2013. Turing has an extensive legacy including an annual award for computer science innovations. He is due to appear on the Bank of England £50 note, to be released in June 2021. ([Reference](#))

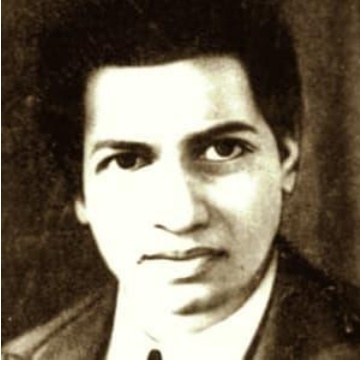
Ada Lovelace



Born two centuries ago, Ada Lovelace was a pioneer of computing science. She took part in writing the first published program and was a computing visionary, recognizing for the first time that computers could do much more than just calculations. In those days, there were no places for girls in the United Kingdom's universities. However, girls from wealthy, aristocratic families could be educated to a high level by private tutors. Ada worked closely with Charles Babbage. Babbage wrote and created the Analytical Engine that showed how complex calculations could be automated. Ada Lovelace responded by adding notes to the ideas. Her notes were three times more extensive than the original work. When her English translation of *Sketch of Charles Babbage's Analytical Engine* was published, most of the work published was actually her own. She added algebraic

workings to the notes for how an analytical engine could perform calculations. Babbage himself took on one of the trickiest calculations – Bernoulli Numbers – and sent it to Ada to include in her work, but she detected and corrected what Babbage himself described as 'a grave error.' In her paper, she included the world's first published computer program, or algorithm – this was the Bernoulli number algorithm – and hence she is often cited as the world's first computer programmer. Ada Lovelace broke new ground in computing, identifying an entirely new concept. She realized that an analytical engine could go beyond numbers. This was the first ever perception of a modern computer – not just a calculator – but a machine that could contribute to other areas of human endeavor, for example composing music. Ada Lovelace had grasped that anything that could be converted into numbers, such as music, or the alphabet (language) or images, could then be manipulated by computer algorithms. An analytical engine had the potential to revolutionize the way the whole world worked, not just the world of mathematics. ([Reference](#))

Srinivasta Ramanujan



Ramanujan was born and lived in India during the British Rule. Though he had almost no formal training in pure mathematics, he made substantial contributions to mathematical analysis, number theory, infinite series, and continued fractions, including solutions to mathematical problems then considered unsolvable. Ramanujan initially developed his own mathematical research in isolation. Seeking mathematicians who could better understand his work, in 1913 he began a postal correspondence with the English mathematician G. H. Hardy at the University of Cambridge, England. Recognizing Ramanujan's work as extraordinary, Hardy arranged for him to travel to Cambridge. In his notes, Hardy commented that Ramanujan had produced groundbreaking new theorems, including some that "defeated me completely; I had never seen anything in the least like them before". During his short life, Ramanujan independently compiled nearly 3,900 results (mostly identities and equations). Many were completely novel; his original and highly unconventional results, such as the Ramanujan prime, the Ramanujan theta function, partition formulae and mock theta functions, have opened entire new areas of work and inspired a vast amount of further research. His notebooks have been analysed and studied for decades since his death as a source of new mathematical ideas. As late as 2012, researchers continued to discover that mere comments in his writings about "simple properties" and "similar outputs" for certain findings were themselves profound and subtle number theory results that remained unsuspected until nearly a century after his death. He became one of the youngest Fellows of the Royal Society and only the second Indian member, and the first Indian to be elected a Fellow of Trinity College, Cambridge. Of his original letters, Hardy stated that a single look was enough to show they could have been written only by a mathematician of the highest calibre, comparing Ramanujan to mathematical geniuses such as Euler and Jacobi. In 1919, ill health compelled Ramanujan's return to India, where he died in 1920 at the age of 32. His "lost notebook", containing discoveries from the last year of his life, caused great excitement among mathematicians when it was rediscovered in 1976. A deeply religious Hindu, Ramanujan credited his substantial mathematical capacities to divinity, and said, "An equation for me has no meaning unless it expresses a thought of God." ([Reference](#))

You

What will be your story? At Barrington High School, we believe that every student has the ability to learn and do mathematics and computer science. Every student's path through these amazing fields is unique. No matter who you are or where you start, we want you to have a positive experience focused on growing your skills and your depth of understanding. Learning to think logically, finding connections, and analyzing problems from multiple perspectives will be skills that benefit you no matter your future path.