CHILDHOOD

Maryam is a Biblical name. It is also a Quranic name. In fact, the Quran mentions the name Mayam more often than the Bible. There are 114 Surahs in the Quran and the only Surah that is named after a woman is Surah number Nineteen--Mayam. And today we will share the story of Maryam Mirzakhani, named after Surah Maryam.

FROM PHYSICS TO MATH

Math is the language for physics. Mary Curie won the Nobel Prize in physics in 1903. However, women had to wait more than 100 years to win the Fields Medal, which is considered the Nobel Prize in mathematics. It was none other than Maryam Mirzakhani who accomplished this milestone before any other woman. Maryam was born in Iran on 12 May 1977. However, her childhood education was seriously affected by the war against neighboring country Iraq.

Maryam Mirzakhani, Roya Beheshti, and others at the Math Olympiad preparation camp in summer 1994.

WAR

Saddam Hossain, the then newly elected President of Iraq invaded Iran which is infamously known as Iran-Iraq War in 1980, when Maryam was three years old. This bloody war lasted 10 years. That really devastated Maryam's childhood. Not only Maryam--but also every student was affected by this bloody war which killed more than 2 million people most of whom were Iranian due to Iraq's using chemical weapons against Iran. The war ended in 1988. Mayam was 11 years old. Finally Maryam got a chance to start her education without fear.

FROM WRITER TO MATHEMATICIAN

Maryam's dream was to become a writer. She immediately took the gifted and talented exam and got accepted at Farzanegan School. Roya Behesti, one of Maryam classmates at Farzanegan School, recalls that in 7th grade, Maryam didn't score 100 on a math exam. She tearfully tore up the exam results. When Maryam returned from summer break, she was suddenly became an exceptional in mathematics. She had an exceptional ability to concentrate on a problem and found multiple solutions to any given question. Overcoming a challenge on a subject she was not at her best was what drove her toward mathematics and she ended up becoming one of the most influential geometrists of the 21st century.

EDUCATION

Maryam completed her undergraduate in mathematics at Sharif University in Tehran, Iran in 1999 and subsequently went to Harvard for her PhD in Mathematics. In her doctoral thesis, Maryam developed a formula that relates the cardinality of the set of geodesics to their length. At Harvard, Maryam developed an unexpected proof, an old conjecture posed by none other than Edward Witten, one of the foremost physicists of the 21st century. He became the first physicist to be awarded a Fields Medal in 1990. Maryam's dissertation resulted in three papers published in the three of the most prestigious journals in mathematics: the Annals of Mathematics, Inventiones Mathematics, and Journal of the American Mathematical Society. "The majority of mathematicians will never produce something as good -- and that's what Maryam did in her thesis (Farb 2017).

Curtis McMullen, Maryam PhD adviser at Harvard, noted "She has a fearless ambition when it comes to mathematics." Maryam's doctoral dissertation was on counting loops on hyperbolic surfaces and she contributed significantly to the analysis of dynamics of abstract surfaces connected to billiard tables.

CAREER

Maryam worked in dynamical systems, in particular mathematical billiards, which consists of a point particle moving on a frictionless billiard table and hitting the sides of the table without losing momentum. Maryam also worked extensively with manifolds. A manifold is thus a surface that looks flat close-up, but might be an entirely different surface when you zoom out and look from afar. Maryam was honored with the Fields Medal for her work in "the dynamics and geometry of Riemann surfaces and their moduli spaces".

DEATH

DEATH

Mirzakhani was diagnosed with breast cancer in 2013. In 2016, the cancer spread to her bones and liver, and she died on 14 July 2017 at the age of 40 at Stanford Hospital in Stanford, California. Her work bridges several mathematical disciplines—including hyperbolic geometry, complex analysis, topology, and dynamics—and in return deeply influenced them all. Mirzakhani was married to Jan Vondrák and they have a daughter named Anahita.