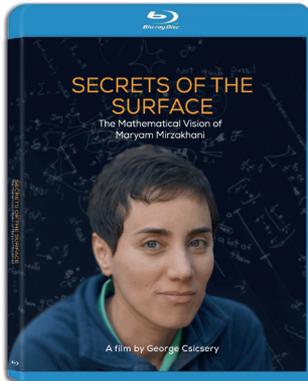




BOOKSHELF

New and Noteworthy Titles on our Bookshelf
March 2021

ZALA Films, 2020, 60 minutes. Cover courtesy of George Csicsery/
Zala Films.



Secrets of the Surface
The Mathematical Vision of Maryam Mirzakhani
a documentary film
by George Csicsery

Secrets of the Surface is a glorious documentary, suitable for a general audience, about the life and achievements of Maryam Mirzakhani (1977–2017). Her brief life was full of firsts: Mirzakhani was the first female Iranian to earn

a gold medal (and a perfect score!) at the International Mathematical Olympiad (IMO) and the first female Fields Medalist. *Secrets of the Surface* paints a vivid and detailed picture of a true superstar, starting with her childhood and adolescence in Iran before moving on to her doctoral work at Harvard, her professorship at Stanford, and her Fields Medal.

Friends and family, mentors and collaborators all contribute to the story, which is equal parts touching, enthralling, and informative. Mirzakhani herself narrates a surprising amount of the movie (these passages come from a 2014 recording produced by the Simons Foundation). Computer-generated illustrations and animations make Mirzakhani's work come to life in a manner that is understandable by a wide audience. The filmmaker, George Csicsery, is well known in the mathematical community for his documentaries about famous mathematicians, such as Shiing-shen Chern, Paul Erdős, Ron Graham, Paul Halmos, Julia Robinson, and Yitang Zhang. The Mathematical Sciences Research Institute (MSRI) supported the making of the film, which can be streamed through Vimeo or purchased in DVD or BluRay format.

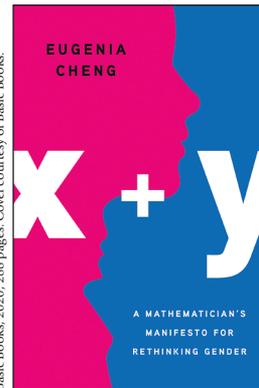
Secrets of the Surface is a touching and inspirational tale that is perfect for undergraduate mathematics majors. The filmmaker encourages public screenings and provides the e-mail address geocsi@zalafilms.com for those

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interested in arranging such screenings. A fourteen-page discussion guide is available in PDF format on the filmmaker's website.



Basic Books, 2020, 288 pages. Cover courtesy of Basic Books.

x+y
A Mathematician's Manifesto for Rethinking Gender
by Eugenia Cheng

Eugenia Cheng, author of *How to Bake Pi* (2015), *Beyond Infinity* (2018), and *The Art of Logic* (2019), has written another engaging mathematically inspired book for the popular audience. "The problem I am going to address in this book," Cheng declares, "is the divisiveness of arguments around

gender equality." What is the point of bringing mathematics into a discussion of gender? Most obviously, mathematical thinking brings precision and clarity to definitions and arguments. Throughout *x+y*, Cheng points out the many flawed arguments and misuses of logic and statistics that permeate contemporary discussions of gender. "Math gives us a framework for making justifications and also for evaluating them," she explains, "so it gives us a way of assessing the value of any particular opinion. This is why math can be relevant to all sorts of things that don't appear to be obviously 'mathematical.'"

Although there are a few biographical sketches of important and influential mathematical figures, such as Emmy Noether and Maryam Mirzakhani, a dash of elementary algebra, and a couple of graphs, this thought-provoking book is aimed for a mass-market audience and assumes no knowledge of advanced mathematics. Nevertheless, Cheng's own research field, category theory, informs her approach to gender. She focuses on relationships between individuals, often within a power structure, as opposed to set membership. "The categorically inspired approach will show us ways in which we can treat men and women the same if they relate to others in the same way," Cheng tells us, "it means that we can find the types of behavior that are important or beneficial, find people who exhibit those behaviors, and treat those people as 'the same.'... This provides a more nuanced solution, although it is also more difficult than simply paying women the same because 'men and women are the same.' But it is crucially less divisive."