

2026 Leelavati Prize: Hannah Fry

by Allyn Jackson

When you're trying to communicate technical ideas to people, you have to create a motivation instead of starting with the technical idea... You have to get [your audience's] permission to talk to them, and that's something that's earned, right? Not demanded. I spend a lot of time thinking about how you do that.

— Hannah Fry, *Mathematics Today*, February 2024

Hannah Fry stood at the center of a small stage in front of a live audience of 400 who had packed the theater of the UK's Royal Institution. A large plastic bag of icky-looking greenish gunk hung by a string a few meters above her head. The audience called out the countdown from 5 to 1 before the string was snipped and the bag shot downward. As Fry stood fast, the bag halted mid-air, dangling almost in front of her face—exactly as planned. Delighted applause rang out.

Fry explained the setup. Attached to the string was a small weight that, when the string was snipped, caused the string to wrap around a stick enough times that the friction between string and stick stopped the bag's downward motion. She had calculated the needed weight using mathematics. The audience knew that the scheme was unlikely to go awry and leave the front-row attendees, and Fry herself, splattered with gunk. “Still, it's inevitable that you feel a little bit worried,” Fry told the audience. “We're all humans. We find it hard to override our instincts. We're not built for calm and rational thought. But that is the reason we created mathematics. It's a way to step outside ourselves and be objective.”

Fry used this demonstration as the opening of the 2019 Christmas Lectures, a prestigious tradition sponsored each year by the Royal Institution and broadcast on television in the UK. It's just one example of Fry's many activities aimed at making mathematics come alive for the general public.

In lectures, podcasts, and video presentations Fry exhibits an extraordinary ability to explain complex phenomena in a lively and lucid way. Equally successful are her written works, which include four widely praised books displaying her eloquence and intellectual gravitas. She never talks down to her audience, but rather up to the subject-matter, inviting them to share in her authentic awe and enthusiasm.

Fry calls herself an “accidental broadcaster”: She did not aim to become a mathematics popularizer. After earning her PhD in mathematics in 2011 at University College London, she joined UCL's Center for Advanced Spatial Analysis. She was a member of an interdisciplinary team of architects, urban planners, scientists, and

mathematicians who focused on cities, modeling everything from crime patterns to transport systems. Fry began doing public presentations about the team's work, speaking for example on the mathematics of crime control with specific focus on the 2011 London riots.

She was thrust into the limelight in 2015, when her TED Talk on "The Mathematics of Love" went viral; it has since amassed well over 6 million views. She wound up writing a book with the same title, which became a bestseller and was translated into a dozen languages. Building on this success through videos, radio, TV, and public talks, Fry was quickly recognized as an unusually effective and dynamic popularizer of mathematics. She published her second book in 2018, *Hello World: How to Be Human in the Age of the Machine*, which won the 2020 Asimov Prize and was shortlisted for multiple international awards.

In 2018, she received the Christopher Zeeman Medal, which recognizes outstanding contributions by mathematicians in promoting mathematics to the public. The medal is presented jointly by Britain's two main mathematics organizations, the Institute for Mathematics and its Applications and the London Mathematical Society. Among the works highlighted in the citation for the medal was Fry's hugely popular podcast series *The Curious Cases of Rutherford and Fry*, which launched in 2016. "For a STEM-based program to perform this well compared to so many comedy shows, celebrity interviews and other distractions is simply unheard of," the citation said (STEM stands for science, technology, engineering, and mathematics).

It was in the following year, 2019, that Fry was invited to give the Royal Institution's Christmas Lectures. These lectures were founded in 1825 by physicist Michael Faraday as a forum for highlighting the excitement of current scientific developments in a way accessible and entertaining to the general public. Then 35 years old, Fry was the youngest person to have given the lectures and only the second mathematician; the first was Christopher Zeeman, in 1978.

Fry's Christmas Lectures, titled "Secrets and Lies—The Hidden Power of Maths", attracted more than 2 million viewers when it was broadcast on television, and the YouTube video has racked up 600,000 views. The reach of the lectures is even wider than these numbers suggest, as teachers all over the world have incorporated material from the lectures into their classroom presentations.

Fry has also earned accolades for the public-spirited dimensions of her work. In 2018, a century after the pandemic that killed millions around the globe, she hosted a BBC documentary about pandemics. In conjunction with the documentary she led a citizen-science experiment that included recruiting residents of a town in the UK to agree to be tracked via their mobile phones for one day. The data gathered in the experiment was subsequently used by researchers when the Covid pandemic hit in 2019.

During the pandemic, Fry collaborated on scientific studies of patterns relevant

to contact tracing, and these studies were used by the UK government in its effort to battle Covid. She became a trusted public figure who could authoritatively explain concepts like exponential growth and statistical modeling. In this way she helped people develop an analytical approach to making sense of pandemic news that was often confusing and sometimes downright misleading.

In 2021, Fry was diagnosed with cancer and underwent major surgery. This experience inspired her 2022 BBC documentary *Making Sense of Cancer*, in which she examined the emotional and quantitative aspects of fraught decisions about medical treatments. Her skill in blending empathy and analysis also informed another 2022 documentary, *Unvaccinated*, in which she sought to understand why some people refuse vaccines and presented mathematically based arguments supporting vaccination.

The value of Fry's work has been widely recognized in the academic community. In 2022, she was elected as a Fellow of the Royal Academy of Engineering. Two years later, she was appointed to a two-year, honorary position as President of the Institute of Mathematics and its Applications, the United Kingdom's chartered professional body and learned society for applied mathematics. In this capacity she led the IMA's 60th anniversary celebration, which included several public events. At the start of 2025, Fry joined the Faculty of Mathematics at the University of Cambridge as the university's first Professor of the Public Understanding of Mathematics. She is also a Fellow of Queens' College, Cambridge.

Fry brings to her work a large dose of charisma, an impish sense of humor, and even a dash of glamor. But she wears these qualities lightly, bringing them to the service of communicating about mathematics. "Really good communication is not about you," she said in an interview with *Mathematics Today*. "It should never be about you, and it should never start with you. It has to start with the people you're talking to." With this approach she has consistently been able to connect to audiences that are beyond scope of most mathematics outreach efforts. Hannah Fry's unpretentious way of exemplifying and celebrating the analytical mindset of mathematics helps convince her audience that this mindset is available to them, too.