A Mathematician Hosts *NOVA Wonders*

Sophia D. Merow

When, in 2015, Harvey Mudd College professor Talithia Williams got an email from a producer of the public television science program *NOVA*, it felt too good to be true. Might she have any interest in being involved with an episode on prediction? Would she want to host it? What about hosting a six-part series exploring the frontiers of human knowledge?

The conversation continued for months—via email, by phone, and in person over meals in Claremont, CA, and Baltimore, MD. “The entire time I’m just like, ‘Yeah,’ ‘Sure,’ ‘I’ll host a show,’” Williams recalls, her intonation conveying some unobtrusive skepticism. “It didn’t seem real because there were so many things that needed to line up to make it happen.”

NOVA needed to raise three million dollars, for one thing, to make the six-episode series a reality, and Williams had a hard time—at first, anyway—believing that the producers wanted *her*. “Like, really,” she says, “you just found me off my TED talk and now I’m going to host a show?”

Williams had also been skeptical when one of her students, Elly Schofield, approached her about participating in the third TEDxClaremontColleges event, held in February 2014. Her initial reaction to the event’s theme, “Unexpected Narratives,” was “I’m a statistician. I don’t tell stories.” But under pressure from Schofield—and with assistance from her and TED veteran and fellow Harvey Mudd professor Art Benjamin—Williams developed a talk around the idea of telling stories with data. In “Own Your Body’s Data,” Williams used graphs, personal anecdotes about childbirth and emergency room visits, and a “Show me the data!”

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refrain to highlight health insights potentially gained by tracking biodata like waking temperature or blood pressure.

Well-received at the Claremont Colleges event, Williams’s talk was picked up by TED in August 2014 and featured on the TED website (<https://bit.ly/1SIctkx>). *NOVA*’s talent scouts saw it, recognized in Williams the makings of an on-screen science communicator, and reached out by email.

Though slow in solidifying, the partnership *NOVA* proposed eventually worked out. Williams did host that episode on prediction. An hour-long examination of how predictions underpin many aspects of modern life and why some succeed spectacularly while others fail, “Prediction by the Numbers” (<https://to.pbs.org/2EHCdCr>) included appearances by Billy Beane of *Moneyball* fame;

In *NOVA*’s “Prediction by the Numbers,” Talithia Williams demonstrates the power of the wisdom of the crowd...with jelly beans.

FiveThirtyEight founder Nate Silver; and mathematicians such as Keith Devlin, Jordan Ellenberg, and Rebecca Goldin.

Williams, who holds an undergraduate degree in mathematics from Spelman College, a masters in mathematics from Howard University, and a PhD in statistics from Rice University, also landed a gig less focused on her field of study. *NOVA Wonders* (<https://to.pbs.org/20-M0x9k>) devotes one hour to each of six big questions about life and the cosmos. One episode tackles “What’s the universe made of?” Another digs into “Can we build a brain?” In “Are we alone?” viewers meet SETI researchers scanning the skies for signs of extraterrestrial intelligence. In “What’s living in you?” an entomologist shows science museum visitors the arachnids living on their faces. Mathematics plays only a supporting role in *NOVA Wonders*, with mathematical physics and data analytics making cameo appearances. But in the title sequence of each show, there’s host Talithia Williams, introducing herself: “I’m a mathematician,” she says, “using Big Data to understand our modern world.”

NOVA employs a team of scientists and other professionals to frame questions, track down experts, and script episodes, so Williams wasn’t doing any of that as host of *NOVA Wonders*. Her responsibility, she says, was twofold: to “serve as a scientific authority” and to “enthusiastically communicate the beauty of science.”

Enlisting scientists as hosts—as opposed to Tom Cruise or Morgan Freeman—gives the program authenticity, Williams says. Each host—Williams was joined by co-hosts André Fenton, a neuroscientist, and Rana el Kaliouby, a computer scientist—could step in and inject authority into the show whenever her or his specialty came up. “So anything that had to do with math, statistics, or data, I became sort of the expert who was brought to the table,” Williams explains.

Williams and her co-hosts received segment scripts in advance, and were encouraged to provide feedback. Sticklers for accuracy, the *NOVA* crew didn’t mind when, even as filming was under way, Williams asked that statistics be verified or wanted to tweak a phrase because “a mathematician wouldn’t say it like that.”

“We definitely weren’t hired to be a pretty face and read the script,” Williams recalls.

There’s a lot more to science communication than reading a script, Williams says. You have to want people to understand what you’re talking about, and to convey that. “Your actions and your gestures and your tone have to really invite people to the table and invite them to take on your enthusiasm for a particular topic,” she explains.

But it’s a modulated enthusiasm that’s required. However jazzed you are about the potential benefits of gene therapy, for instance, you have to temper your excitement

when reporting that a clinical trial killed an eighteen-year-old suffering from a hereditary liver condition. Exuberant by default, Williams found the sadder segments the most challenging to shoot, often needing multiple takes to nail the appropriate level of engagement.

“I did musical theater in high school and some acting,” Williams says. “I think I leaned more on those skills than my skills as a mathematician.”

Williams watched public television as a child, but didn’t see herself reflected there. *NOVA* readily admits, according to Williams, that in the 1970s, 80s, and 90s, the experts they presented to the viewing public were, overwhelmingly, white men. “They feel like they did a great job of inspiring other white boys to be scientists, and so I think they’re trying to make a course correction,” she says. “They’ve been intentional to make sure that the constant presence you see throughout every episode is two women and three people of color.”

Mathematician Talithia Williams (center) cohosts *NOVA Wonders* with computer scientist Rana el Kaliouby (left) and neuroscientist André Fenton (right).

Los Angeles Times television critic Robert Lloyd, for one, caught the show’s drift (<https://lat.ms/2P16Dyt>): “Without making a point of it,” he wrote in April 2018, shortly after the show aired, *NOVA Wonders* “sends the message that scientists come in a range of ages, genders, colors and ethnicities, with a range of hairstyles, clothing and research specialties.”

Williams knew going into *NOVA Wonders* that the series wasn’t going to leave viewers with an understanding (or even an awareness) of her research area. (She develops statistical models that emphasize the spatial and temporal structure of data, and applies them to problems in the environment.) Her goal, rather, was to give girls of color an image of someone who looks like them who is excited about math and science—something she never had. Until the book and movie came out, Williams had not heard of *Hidden Figures* heroines Katherine Johnson and Dorothy Vaughan, even though she spent four summers at NASA as a NASA scholar. If anybody should have known about these women, she should have. “And what a difference it would have made to know that they came before me,” Williams says. She thinks *NOVA Wonders* is “trying to highlight to a really diverse country that lots of diverse people can do science and are doing science.”

COMMUNICATION

Involvement with *NOVA Wonders* has, indirectly, enabled Williams to spread the word about the likes of Johnson and Vaughan. The visibility that came with hosting the show has garnered Williams more speaking invitations, and she uses these to promote her book, *Power In Numbers: The Rebel Women of Mathematics*, which came out in May 2018 (and was reviewed in the February 2019 issue of *Notices*). "I like that I can go and say 'I did *NOVA Wonders*, it was amazing, and there are also these women who do math, and math is awesome too,'" Williams says. "I think the two of those together makes for a really powerful way to engage the public."

Whether *NOVA Wonders* continues to engage the public will depend (as does so much) on funding. The 2018 series attracted a cohort of viewers younger than *NOVA*'s typical demographic of fifty- or sixty-something life-long learners, and there's interest in serving this audience going forward. But since a show with the scope of *NOVA Wonders* takes years to realize, a better near-term prospect is a stand-alone show more like "Prediction by the Numbers." Nothing is confirmed yet, but a math-only hour hosted by Williams is a distinct possibility. Something about the origins of zero and infinity, perhaps, or the Fibonacci numbers in nature? Stay tuned.

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Credits

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