



Photo: Rob Kennard

Making *Einstein's Big Idea*

I worked on the film *Einstein's Big Idea* for about eighteen months—from early research to completion of the edit. In all that time two questions recurred: How does a filmmaker write a film about science geniuses? How do you get actors to play physicists? As we Brits like to say, “Blimey!”

My short (and more truthful) answer to both those questions is that you follow your nose and hope for the best. My considered answer (and one which conveniently rewrites history with the benefit of hindsight) would be as follows:

My dad was an electrical engineer and a part-time artist. So my brain has receptors for both flavors of human endeavor. I studied physics and chemistry at high school. I studied psychology, philosophy of science, and artificial intelligence at university. I studied the nature of creativity at grad school. But of course I hung around with the art school lot and the theater group crowd. So I'm a filmmaker, but I'm also not an alien to the world of physics and I have a vague memory of T.S. Kuhn.

What struck me most about the book *E=mc²: A Biography of the World's Most Famous Equation* by David Bodanis, on which the program is based, were the human stories behind the icons. I guess I wanted to be iconoclastic. In a vaguely jealous way, I wanted to see the flawed person behind the myth.

Einstein was a bit of a dude, a skirt-chaser. Faraday was driven by a fundamentalist religious faith. Lavoisier was a really uptight guy. Maxwell, a hero in my homeland of Scotland, was someone I knew nothing about (despite walking into a million buildings named after him). Émilie du Châtelet, just a wild, wonderful person, and Lise Meitner, an adventure story/opera all on her own. How can you not make a great film with such a cast?

So having established that scientists are not boring, I moved onto stage two. I read everything I could, right down to primary sources—diaries and letters. Then I visited esteemed professors across the great lands of America. Only one made me feel like a fool. He wasn't trying to, he just had that attitude: “I'll explain it once, if you don't get it, then I haven't got the time to explain it twice.” Eventually, after about six months of study, I felt I just about “got it.” Then I had to find a way of explaining it to the “myself” of six months previously. Luckily I had an advisory panel of professors and high-school physics teachers to guide me. To be honest, it was trial and error.

In making a 110-minute film about two hundred years of science, you have to be ever-so-slightly reductionist. I boiled the science down as much as I could. There is a fine line between too much and too little science in a program like NOVA. The viewers who understand the science want more science; those attracted to the human stories want less science. You can't win. We had a slogan on set when we were filming: “When the science gets boring, cut to the sex.”

I think the thing that comes across most powerfully to me about all the geniuses in the program is that they were all hugely passionate for their subjects and totally unreconstructed workaholics. I've only given a taste of how bright, how addicted to their mission, how “other” these scientists were. We only scratched the surface of these remarkable people.

If anything, *Einstein's Big Idea* is more of a fairy tale than a definitive account. It's meta-reality. In fact, what I've done is the opposite of what I thought I was setting out to do: I've turned physicists into heroes. It's a very contentious thing to do in the world of history of science. Quite a lot of physicists who have seen the film seem to like it, however. Why should cops, firefighters, and soldiers get all the mythologizing?

And to finish, how do you explain physicists to actors? I repeat, “Blimey!” Well, I tried to tell them how keen you all are, how absorbed and intense. I went to great lengths to unpick your wonderfully complex, bizarre personalities. You should have seen the blank expressions. In the end, two words solved the problem. “Star Trek.” Just say the gobbledegook and keep smiling! Of course, the actors got the passion, the obsession, and the drive, but the math and physics? Forget about it!

Gary Johnstone is producer and writer of Einstein's Big Idea, based on the book E=mc²: A Biography of the World's Most Famous Equation by David Bodanis. The film will premiere on October 11, 2005, on PBS's NOVA, partially funded by the US Department of Energy. See www.pbs.org/wgbh/nova/einstein/