

# Extreme Adventures and Saving the Planet



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## LAURA HOCH

**B.S.:** Chemistry, The Pennsylvania State University

**Ph.D.:** Materials Chemistry, University of Toronto

**WHAT SHE DOES NOW:** Material Innovation at Patagonia

**L**aura Hoch's career began with a murder. Well, not a real murder—a murder-mystery game staged by her high school chemistry teachers in central Pennsylvania.

"There would be all these clues, and then you put together a forensic report based on all you've been able to find out by analyzing stuff," she says. "It wasn't on my radar to be a chemist, but I just had that memory of chemistry being really fun and interesting."

When she got to college as an environmental resource management major in 2005, that fond memory nudged her into learning about green chemistry. Green chemistry focuses on designing products and processes that reduce the generation and use of hazardous substances.

Hoch went on to design new solar cells at Los Alamos National Lab, and she earned a Ph.D. in materials chemistry, creating devices that convert carbon dioxide into fuels.

Now, Hoch is a material innovation chemist for Patagonia, where she uses chemistry to make sustainable and durable outdoor apparel. Was she always interested in fashion? "No, not at all. It's still hilarious to me," she says. But the job fits her like a glove. "It's a really fun hybrid of like, my nerdy chemistry self and my outdoors self, all with the thread of my environmentalist self."—*Max G. Levy*

### Do friends think your job is cool?

I think so, yeah. I feel really lucky. I mean, I literally get to go ice climbing in Scotland for my job. To make products, you have to know how they work. And so some of the coolest experiments I've gotten to do are where I get to go out in the field to try a product and see how it works.

### Is caring for the environment what motivated your work in chemistry?

Absolutely. I started doing research during my freshman year of college. And that's where I kind of got this idea. You can care about the environment, and you don't want to have toxic chemicals. A professor showed me that chemistry can actually be the solution to that. If you can design stuff from the beginning to be less hazardous, you don't have to clean up pollution in the end.

### Does Patagonia use PFAS in their weather-proof clothing?

Yeah, fluorinated compounds are still used pretty widely in the apparel industry. As a company, we're committed to getting out of fluorinated chemistries entirely. If it were easy to just flip the switch and be like, "aaand we're done," we would have done that many years ago. But it's just really challenging.

### How do chemists reduce the environmental impact of the clothing industry?

Eighty percent of the impact is baked into the actual garment itself. A couple years back we partnered with a chemical company using a different type of dye for denim. Because of the different way that it binds to the surface of the cotton fibers, you're able to dramatically reduce the amount of water [needed to produce it]. So instead of 5 to 15 rinses and baths that it passes through for a traditional denim dyeing with indigo, it only needed, depending on the shade, like three passes. So there's a way that you can be very strategic about a chemistry choice to reduce impact.

### How can students approach thinking about chemistry to better understand its environmental effects?

I think my favorite way to do it is to pick an object, and then just diagram all the things that go into it so that students can see what things are made of. What they're made of is what determines their impact. And so I think that's the first step to designing better—it's understanding how things are linked.

### What advice do you have for high school chemistry students?

I think with a degree in chemistry, you can do anything. But even if you don't get a degree in chemistry, just knowing about it is interesting, because it's what underlies our world. It's how everything happens!