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FEBRUARY 2020

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TALK SHOW WITH **MARY ELIZABETH WINSTEAD**
OUTERWEAR FROM OUTER SPACE
BIKING FRANCE'S **MONT VENTOUX**



FORWARD — MOMENTUM —

Virgin Group founder **Sir Richard Branson** and Delta CEO **Ed Bastian** on the unrelenting need to innovate on behalf of customers, employees and the planet.



OUTERWEAR, MEET OUTER SPACE

APPAREL COMPANIES ARE LOOKING TO NASA FOR MATERIALS THAT CAN KEEP HUMANS MORE INSULATED THAN EVER. **BY DERRIK J. LANG**



It's happened to all of us. You take a trip to a gloriously scenic destination and pose for a photo that you think will be loved on social media, then end up absolutely hating how you look and don't actually post it. For cold-weather adventurers, the culprit is often the outerwear: thick, puffy parkas, pants and accessories.

That was the situation six years ago when Michael Markesbery ascended to the top of Mount Säntis in the Swiss Alps during a college backpacking trip across Europe. He was bundled up in so much cold-weather gear that he looked more like the Michelin Man than himself.

"There was so much bulk and so many layers," says the outdoor enthusi-

ast and self-proclaimed science geek from Ohio. "It didn't make sense to me that in the last 100 years, we've been doing the same thing with outerwear, just taking animal by-products and shoving them into a jacket. There had to be a better way."

A year later, when the premed major was back at Miami University in Oxford, Ohio, Markesbery was

awarded a prestigious Astronaut Scholarship and learned about a unique material called aerogel from astronaut mentor Robert L. Gibson. It's the stuff that NASA uses to insulate spacesuits and shuttles. Markesbery thought if it was good enough for the Mars rovers, it'd work for apparel right here on Earth (and look good on Instagram, too).

Markesbery teamed up with his research lab pal and fellow Miami University student Rithvik Venna. They began looking into how to use the silica-based substance—the lightest, thinnest and warmest insulator known to humankind—in a jacket. The pair devised a solution and released an aerogel-laced parka to much fanfare on Kickstarter in 2015, and they later secured \$10 million in funding to launch the Oros apparel line.

Unlike down-filled outerwear, aerogel doesn't require puffiness to trap air and provide better insulation. Markesbery notes that the result is better heat retention than the highest-quality feathers (and no comparisons to Ralphie's little brother, Randy, from *A Christmas Story*). After years of incremental updates, from comfort-inducing polymers to foil-like linings, the addition of aerogel could be a giant leap for the \$13 billion outerwear industry.

"This is where outdoors meets science," Markesbery says of his Portland, Oregon-based company, which now produces jackets, pullovers, vests, pants, gloves and hats boasting Solarcore, their patented flexible rendition of aerogel. The 27-year-old Oros cofounder frequently demonstrates how much cold his parka, which sells for \$350, can withstand by donning one and getting blasted with liquid nitrogen at -321 degrees Fahrenheit—more than two times colder than anywhere on Earth. (You can see it for yourself on YouTube.)

Oros isn't alone in adopting aerogel. Several long-established apparel makers now regularly are using it in their products. L.L. Bean sells jackets

and sleeping bags sporting aerogel, while Helly Hansen and Daehlie line pockets with it. Merrell's Thermo Rouge boots feature aerogel foot beds and toe caps. (Aerogel's beginning was rocky: In 2010, Champion filled a jacket with aerogel and sent mountaineer Jamie Clarke up Everest. He overheated.) It's still more expensive than synthetics or down, but that's changing as production increases and more manufacturers add it to their arsenals.

While aerogel may sound like a newfangled sci-fi creation straight out of *Back to the Future* or *Star Trek*, it's actually been around since the 1930s, when it was invented by American scientist Steven Kistler after he replaced the liquid part of a gel with air to create the world's least-dense solid. It went mostly unused for decades until NASA employed the material to insulate the Sojourner rover, as well as collect particles from comets during the Stardust mission.

"Capturing things in space is really difficult because they're moving so incredibly fast," says veteran scientist Steven M. Jones of NASA's Jet Propulsion Laboratory. "Because aerogel is so porous, it does a really good job of slowing and stopping particles and keeping them mostly intact. And the heat transfer is very slow, so that makes it a very good thermal insulator."

If that's the case, why haven't we seen more applications of aerogel? Other than price, its major drawback is a lack of durability, according to Jones. It's capable of withstanding pressure, but it'll break under shear forces. Jones acknowledges that aerogel could work as a dynamic building insulation, but construction

crews couldn't use typical installation methods without destroying it.

"Over the years, different people in different industries have shown a great deal of interest in aerogel," Jones says. "I remember meeting a professor from the Harvard Graduate School of Design who set it down on a conference table after a talk I gave and said, 'This will change everything!' As far as I know, it hasn't yet." Jones is optimistic yet suspicious of its use in apparel. (You won't find any aerogel in his wardrobe. "I'm too much of a cheapskate," he jokes.)

Besides aerogel, apparel makers are similarly being influenced when they look to the stars. Last fall, British apparel company

Vollebak released the Deep Sleep Cocoon, an \$895 jacket that doubles as a nap pod. Inspired by astronauts who lack environments to regulate their circadian rhythm, the jacket is made from a waterproof and windproof three-layer material and boasts a soft, breathable hood that completely encapsulates the wearer. Vollebak says it was "designed for physical and psy-

chological comfort in inhospitable places"—whether that's a trip to Manhattan or Mars.

Oros cofounder Markesbery's out-of-this-world aspirations go beyond improving upon the jacket—or posing for pics on mountaintops. He actually wants to make outerwear obsolete. "We never got into this to start an apparel company," he says. "Our goal from day one was supersimple. We want to create a long-sleeve shirt that can withstand subfreezing temperatures. We don't want to just create thinner or warmer outerwear. We want to entirely get rid of the necessity of outerwear." ▽

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