



# Momentum:

## Research & Innovation

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Spring 2017

# Momentum:

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Welcome to the latest issue of *Momentum: Research and Innovation*, the research and scholarly activity magazine of the University of Rhode Island. We are proud to share with you the unique accomplishments of the faculty, students and staff in developing scholarship that will help to change the world. The responsibilities of a research university such as the University of Rhode Island include teaching and the discovery of new information. Sharing that new information with others allows it to be applied, leading to improvement in our daily lives. *Momentum: Research and Innovation* is one of the ways we can share our new information and new scholarly activities with the world. We hope you will enjoy the adventures.

Sincerely,

Gerald Sonnenfeld, Ph.D.  
Vice President for Research  
and Economic Development

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# spring 2017



# Designing a Space Odyssey

written by **EMMA GAUTHIER '18**

When it comes to space travel, science fiction and pop culture give us two models for interstellar outerwear: the chunky, white head-to-toe space suits with an opaque face shield, or sleek, multi-colored tracksuits.

But Karl Aspelund, assistant professor at the department of textiles, fashion merchandising and design at the University of Rhode Island (URI), approaches apparel for space travel in a different way when considering on-board clothing for long duration space flight. As we draw nearer to travel beyond our solar system, Aspelund says a monochromatic, polyester future is indicated for mankind.

Aspelund is a member of the 100 Year Starship organization, a group of scientists, anthropologists, engineers, designers and researchers committed to making human interstellar travel capabilities a reality within the next 100 years. He is focusing his research in two main directions, the technical aspect of what a person wears while traveling and living away from Earth, and the anthropological and philosophical side: analyzing behavioral factors related to clothing that are heightened under the strenuous conditions in outer space.

"You can't just stick people in a craft and send them off," Aspelund says. "They have to eat, they have to keep themselves clean, they have to dress, and they have to stay sane."

For long missions, Aspelund explains, personal comfort in such close quarters is a crucial factor. "I told the students on my team that we're not designing clothes for space, we're rethinking the concept of clothing, as if humans had never worn clothes before."

Currently, Aspelund is determining which textiles are best for different challenges travelers may face, especially for missions further than the International Space Station, to Mars and beyond.

"That's what why we have to think about hygiene, durability, and radiation protection, before we begin to consider what the clothes look like," Aspelund says. Depending on funding, he says,





Karl Aspelund  
associate professor  
textiles, fashion  
merchandising and design

“I told the students on my team that we’re not designing clothes for space, we’re rethinking the concept of clothing, as if humans had never worn clothes before.”

- Karl Aspelund

he would like to have garments ready to test their capabilities within the next two years, ideally, in a Mars simulator.

This is where gray scale polyester comes in. One potential method of creating lightweight fabric that also protects from cosmic rays would result in all fabrics being on a gray-to-black spectrum. The outfits may not be radically different than what people wear on Earth, he says, but could look similar except with more options for functionality. There are also gravitational factors to consider in space, therefore something similar to athletic gear makes the most sense, but admittedly limits options. This also leads Aspelund to another issue: individuality.

“The establishment of an individual identity is an inherent desire in humans,” Aspelund explains. “We’re constantly trying to walk the line between belonging to a larger whole, and identifying as a specific person. If everyone around you is dressing the same, you may develop anxiety caused by loss of individuality.”

Aspelund knows just how important the interplay of individuality and group identity is; he did his dissertation research on the history and nature of women’s national dress in Iceland, where he looked into the development of identity with clothing at the individual, the small-group culture, and at the national level. He found that the influence and motivations of personal interaction,

politics, technology and historical tradition, both actual and invented came into play, which resulted in a research project, with Professor Terry Gunnell of the University of Iceland, on nationalist culture creation in Iceland in the late 19th century. This project will be completed with the publication of a book of essays this year.

Aspelund worked as a designer on approximately 40 productions in both film and theater in Iceland for 10 years before coming to the U.S. in 1996, and he says those experiences have fed into his current research, by providing insight into the nuanced relationship of clothing and character.

While many of us may not get to travel to the further reaches of our solar system, Aspelund emphasizes that investing in space research truly benefits society. For instance, by figuring out ways to recycle garments in space, Aspelund says, those procedures could help combat pollution on Earth.

“We should eventually be able to scale the starship’s problems and solutions toward people on

Earth,” Aspelund says. “The importance may indeed be more impactful on the home planet. The starship can be seen to be a testbed for Earth-bound solutions.”

He is focusing his research in two main directions: the technical aspect of what a person wears while traveling and living away from Earth, and the anthropological and philosophical side: analyzing behavioral factors related to clothing that are heightened under the strenuous conditions in outer space.

