→ SUCCESS STORY

Clothes 'made in space'

Background

The lack of convection in space affects the way body heat and sweat are transported and absorbed into an astronaut's clothing. Astronauts often report sweating more during exercise in orbit compared to on Earth, reporting heat enveloping their bodies like an aura.

A warm and humid environment is an ideal scenario for bacterial, viral, and fungal super-infections. Textiles have to be specially adapted for use in space – new fabrics with better thermal and sweat management need to maintain the astronauts' cooling mechanism and reduce microbiological contamination on the International Space Station.

Facts and figures

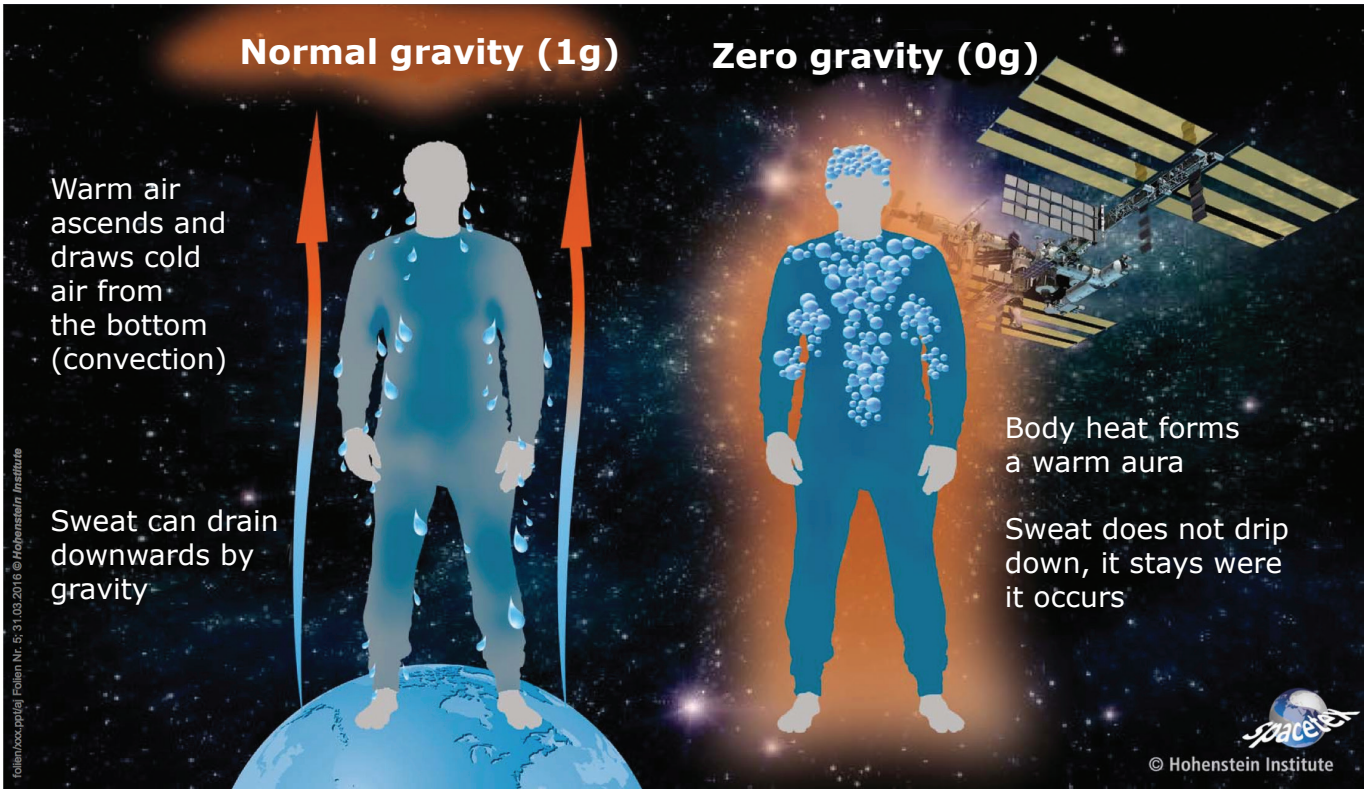
- First clothing physiology experiment to be performed in microgravity
- Space garments offer physical comfort like a second skin, are more hygienic and allow freedom of movement
- All-new insights into the interaction between the body, clothing and climate in space
- The Hohenstein Institute designed and developed the SpaceTex experiment. About 50 people work on research at their headquarters in Germany. The Swiss textile manufacturer Schoeller Textil AG is also involved in this industry-funded research project

Solution

The SpaceTex experiment assessed new fabrics to improve heat transfer and sweat management during exercise. The fabrics were chosen for their antibacterial properties.

ESA astronaut Alexander Gerst wore these high-performance fibers on the Space Station and assessed how comfortable the clothes were in comparison to conventional cotton garments.

> **This project was a perfect kick-starter to build new connections with key players in space human research and textile research.**
>
> *Jan Beringer – Hohenstein Institute*



Outcome

Alexander Gerst's positive feedback coupled with the data from the experiment are helping optimise astronaut clothing for future long-term missions such as a journey to Mars planned for 2030.

Space-proven garments are of great interest when developing innovative textiles for extreme conditions on Earth. T-shirts with ultra-short drying times, for example, would be very useful to athletes but also fire fighters, mine workers and members of the armed forces.

Based on this research, sportswear manufacturers are hoping to improve their products, and a modified polyester has been created for the Swiss military. Textile scientists and engineers are developing a model to be tested during parabolic flights.

> **We will make sure that people here on Earth who push the limits of their physical endurance or have to deliver peak performance in extreme conditions benefit from the SpaceTex research.**
>
> *Hans-Jürgen Hübner – Schoeller Textil AG*