



Topic of the Speech:

Key Technologies and Applications in the Research and Development of High-Performance Clothing for Winter Olympic Training Competitions

Professor Li Liu

Beijing Institute of Fashion Technology
China



Professor Li Liu is affiliated with Beijing Institute of Fashion Technology and holds concurrent positions as an advisory professor and part-time doctoral supervisor at Tianjin Polytechnic University. She serves as the leader of the "China Ice and Snow Scientists" for the General Administration of Sport in preparation for the 2022 Beijing Winter Olympics and is the director of the Institute of Fashion Technology Research at Beijing Institute of Fashion Technology. Over the past five years, she has published more than 80 papers and completed over 50 various projects. In 2019, as the principal investigator, she obtained approval for the National Key Research and Development Program project titled "Key Technology Research and Development of High-Performance Clothing for Winter Sports and Training Competitions," directly contributing to the research and development of training and competition uniforms for 9 national teams, including short track speed skating, speed skating, figure skating, freestyle skiing aerials, bobsled, Nordic combined, and alpine skiing, supporting China's sports delegation with 5 gold, 2 silver, and 2 bronze medals at the 2022 Winter Olympics.

In the past three years, she has received various awards and honors, including the "Most Beautiful Science and Technology Worker" in Beijing (2022), the Capital Labor Medal (2022), the "Most Beautiful Woman Fighter" in the Capital (2022), the "Cultivation Award" at the China Ice and Snow Night (2022), National Sports Advanced Individual (2021), "Textile Luminary" Annual Teacher (2021), and the "Phoenix Plan" Leading Talent in Beijing (2021). Her research and teaching achievements have also been recognized with the second prize of the "Textile Luminary" Science and Technology Award from the China Textile Industry Federation (2020) and the first prize for teaching achievements in Beijing (2018). She currently serves as the deputy leader of the Intelligent Textile Products Working Group (SAC/TA209/WG1) at the National Textile Standardization Committee and holds various academic positions.

In 2021 and 2022, her high-performance sportswear research achievements were twice reviewed by General Secretary Xi Jinping under the theme "Fast, Protective, Warm, and Beautiful." She has received thanks letters eight times from the Winter Sports Management Center of the General Administration of Sport and the Figure Skating Training Team. Her research achievements have been featured in more than 120 special reports by key media outlets such as CCTV, Beijing TV, People's Daily, Xinhua News Agency, and Study Xi Strong Country. During the Winter Olympics, a single Weibo post had a cumulative reading volume exceeding 110 million. As a key recommended participant from the Beijing Organizing Committee for the Winter Olympics, she participated in the recording of "Walking Together to the Future," which had a social spread of over 18.3 billion. Her achievements were also invited to be displayed at the National "Thirteenth Five-Year Plan" Science and Technology Innovation Achievement Exhibition, the 2021 Zhongguancun Forum, and the 2021 National Science and Technology Activities Special Exhibition.



Key Technologies and Applications in the Research and Development of High-Performance Clothing for Winter Olympic Training Competitions

Li Liu

Beijing Institute of Fashion Technology, I Jia, Shaoyaoju, Taiyanggong, Chaoyang District, Beijing, 100029, China

*Presenter's email: fzyll@bift.edu.cn

ABSTRACT (NO MORE THAN 500 WORDS:)

Modern competitive sports, especially winter events, are not just about the competition on the field but also a showcase of the technological prowess and levels of each country. This report summarizes:

1. Trends in the development of competitive sports equipment, presenting cases where equipment innovations have led to improvements in athletic performance.
2. The innovative process of the Chinese Ice and Snow National Team in designing training and competition apparel during the Beijing Winter Olympics cycle. It elucidates the four key technical issues addressed by winter sports equipment: "fast, protective, warm, and aesthetically pleasing." It further explains advancements in research such as multi-effect coupling drag reduction fabrics, drag reduction structural design for competition apparel, protective materials and equipment, intelligent biomimetic materials, and smart heating apparel, specifically focusing on clothing for skill-based sports.
3. The report emphasizes the practical application in nine Chinese national teams, including short track speed skating, speed skating, bobsleigh, figure skating, and freestyle skiing aerials. It discusses the personalized and scientific customization of competition attire, assisting in enhancing the competitive level and contributing to the historic breakthrough of the Chinese team at the Beijing Winter Olympics.