Textiles and Human Thermophysiological Comfort in the Indoor Environment, by Dr. Radostina Angelova, provides both a comprehensive overview of human thermal comfort, as it relates to textiles and clothing, and an in depth exploration of assessing how yarn and fabric properties influence this comfort. Dr. Angelova's background and expertise in the areas of weaving technology and fabric design are exemplified through her use of models and simulations for evaluating air, heat, and moisture transfer in indoor textiles. The organization of the book into four distinct sections is both clear and necessary given the wide range of applications and experiments presented.

In section one, the basics of human comfort within the indoor environment are discussed. The author does an excellent job of providing specific examples of human comfort as they directly relate to textiles and clothing, such as how physical (senses) and psychological (color, texture, and design) aspects are interrelated with physiological factors (thermal perception and movement). Although material regarding the complex interdisciplinary concepts of human comfort is often quite technical, the author's writing style is easy to understand. Angelova tells a story of how each textile product (clothing, bedding, upholstery, etc.) impacts the individual in the indoor environment. In chapter three, the hierarchical structure of textiles (fiber, yarn, and fabric) is presented with a more technical approach as the microstructure, mesostructure, and macrostructure. These terms were clearly defined, but their repetitive use and the textile context of the book would better lend itself to the traditional terms.

In section two, the reader is led into the methodology of the initial experiments conducted on the mesostructure (yarns) and the macrostructures (fabrics) for clothing, bedding, medical gowns, upholstery textiles, and packing materials. The experimental investigation of the mesostructure in chapter six relates air permeability, thermal resistance, and moisture transfer to yarn density, twist, and fabric thickness properties. These results lead the reader into the evaluation of fabrics for multiple end uses in various indoor environments. New relationships established between thermal insulation and fabric properties of clothing and bedding were confirmed in chapters eight through ten which assessed similar relationships for medical drapes, upholstery, and packaging textiles, respectively. The inclusion of the experiment on packing materials was somewhat out of place at initial read, but the author's relation of these materials to storage in indoor environments brought to light their relevance. The final chapter in this section investigates the temperature and relative humidity affects on indoor comfort confirming that textiles are effective barriers against indoor humidity levels for minimal periods of time.

Section three compares the experimental results from section two, to simulated responses gathered by using state of the art techniques for mathematical modeling and numerical simulation. The communication of these models is straightforward; however, there is a critical assumed knowledge base necessary for the reader to fully grasp and understand how specific laws and theories are used to develop such models. While multiple modeling techniques are presented, the author concludes that the most reliable and applied way to evaluate heat and
mass transfer properties is through direct measurement. Techniques presented for simulation and modeling of air permeability and heat transfer include the use of the Hagen-Poiseuille Law and computational fluid dynamics. The final section on modeling and simulation of overall thermophysiological comfort includes establishment of a model of the human body. An in-depth review of the body’s thermoregulation as it pertains to environmental surroundings is given. In the final chapters, the environment, clothing insulation, and activity level of the body are all considered together, and the formation of the clothing microclimate is discussed.

In conclusion, this text is a useful tool for researchers, educators, and students as it summarizes essential literature and foundational knowledge regarding how textiles influence human physiological comfort indoors. With section one serving as an excellent resource, section two gives multiple examples of methodology and experimental investigations for evaluating textiles found in the indoor environment to determine their impact on human thermophysiological comfort. Those interested in modeling and computerized simulations to further analyze human thermal comfort will find sections three and four most beneficial. This book is an excellent resource for those interested in studying human physiology as it pertains to textiles and clothing.