Cleveland State University
College of Science

COLLOQUIUM

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Modeling the Long-term Effects of Thermoregulation on Human Sleep

Friday October 25th at 3pm in RT 1516

Bio: Dr. Prieto-Langarica is an Associate Professor in the Department of Mathematics and Statistics at Youngstown State University. She received her Undergraduate degree in Applied Mathematics from the University of Texas at Dallas in 2008 and her PhD from the University of Texas at Arlington in 2012. Prieto-Langarica's research is in the intersection of mathematics and biology, specifically problems related to the medical field. Recently she started conducting research in data science and public policy. Some of Prieto-Langarica awards include: 2015 Campus Diversity Leadership, 2018 Honors Professor Award, both from Youngstown State University, and the 2019 Alder Award for excellence in teaching by early career mathematician from the Mathematics Association of America.

Abstract: It has long been believed that there is a strong connection between human sleep and energy exertion. The link between human sleep and energy exertion has long been regarded as part of the reasoning for why we need sleep. Perhaps though, the underlying link is more complex than previously believed. In this paper, we describe a mathematical model of human sleep--wake behavior, which supports a recent unifying theory for the function of sleep among all species. The model incorporates thermoregulatory functions and how temperature affects the stages of sleep and its effect on metabolic processes. Solutions of the model are computed for dingle night and average night simulations; Measurements obtained from the simulations as well as the dynamics of the model are discussed.

Refreshments at 2:30pm in RT 1517