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Wisdom of Hives and Mounds: Collective Problem Solving by Super-organisms

L. Mahadevan
Department of Physics, Biology and Engineering
Harvard University

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For more information contact:
Ajay Gopinathan
agopinathan@ucmerced.edu

ABSTRACT

Social insects are capable of solving complex physiological problems using collective strategies. I will discuss our work on some of these problems that include the physiology and morphogenesis of termite mounds, and active mechanisms for ventilation, mechanical adaptation and thermoregulation in bee aggregates.

BIO:

Lakshminarayanan Mahadevan ("Maha") is currently the Lola England de Valpine Professor of Applied Mathematics, Organismic and Evolutionary Biology and Physics at Harvard University. His work centers around using mathematics to understand the organization of matter in space and time, i.e. how it is shaped and how it flows, particularly at the scale observable by the unaided senses. Just a few examples of his extremely creative work include understanding the fluttering of flags, the wrinkling of skin, the "Cheerios effect", origami design, the snapping of Venus Flytraps and the convolutions of the brain. Maha received his M.S. and Ph.D. from Stanford University. He started his independent career on the faculty of the Massachusetts Institute of Technology before moving to the University of Cambridge. He has been at Harvard since 2003. He currently serves as the co-chair of Applied Mathematics in the School of Engineering and Applied Sciences and is the Faculty Dean of Mather House at Harvard University. Among many honors, he is a Fellow of the Royal Society, a Guggenheim Fellow and a MacArthur Fellow.