

DEPARTMENT OF PHYSICS

Fall 2017 seminar series

SKYSCRAPERS FOR LUNGS: PHYSICS OF TERMITE COLONY RESPIRATION

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Wednesday, September 27th, 2017

3:20 pm

Ayer Hall 19

In addition to underground nests in which they raise brood and cultivate fungus, many Macrotermitinae species also build large (~2m tall), geometrically complex, closed structures above ground. As termites only enter the mound for building or repair, their function is presumed to facilitate transport of respiratory gases. However, the mechanisms by which this occurs are still not well understood. From direct field measurements with custom instrumentation, we find thermally driven flows inside the mounds of both *Odontotermes obesus* in India as well as *Macrotermes michaelseni* in Namibia. The thermal gradients driving these flows are not due to metabolic heating, but rather due to diurnal temperature oscillation, a novel example of a biological structure deriving useful work from the environment.