

# Mechanical Engineering Lecture in Energy

## From Microscale Phase Change to Sustainable Thermal Systems Realization



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On Friday, October 30<sup>th</sup> at 4:00pm in 3-370

Advances in the understanding of phase-change heat and mass transfer in single- and multi-constituent fluids are enabling the development of compact thermal systems that not only harvest low-grade heat, but also upgrade it to produce power, cooling, and other end uses. Such novel thermal systems allow cascading of primary energy utilization over several end uses across the temperature spectrum such that waste heat is minimized to the thermodynamically unavoidable levels. Representative approaches to exploit the advantages of microscale heat and mass transfer not only in small-scale devices, but also to extend them to Megawatt-scale applications will be presented. Energy utilization systems for space-conditioning, waste heat recovery, carbon capture, natural gas cleaning, power plant condenser cooling, modular nuclear reactors, and portable cooling for the military and other hazardous duty applications will be presented. The talk will demonstrate that application of these insights into phase-change heat and mass transfer can have a significant impact on the supply, demand and intermediate stages of the energy pathway.

Refreshments will be served before the seminar.  
Please contact Tony Pulsone at [pulsone@mit.edu](mailto:pulsone@mit.edu) with any questions.