

DEPARTMENT OF MATHEMATICS

Fall 2018 Colloquium Series

Heat and Mass Transfer in Soil with Application to Seasonal Renewable Energy Storage and Environmental Remediation

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BSS Room 204, 4:00 PM

The energy supply sector continues to shift from high-carbon fossil fuels to more environmental friendly renewable energy substitutes in the future. An important issue limiting the implementation of renewable energy sources is energy storage, as it is not possible to control the timing of the supply of solar or wind energy. Subsurface thermal energy storage systems have been shown to be effective at storing heat collected from solar thermal panels in the summer so that it can be later extracted during the winter. These systems have attracted growing interest owing to their numerous advantages over other energy storage systems; however, one of the main limitations in large-scale implementation of these systems is low system efficiency. An approach to potentially enhance the efficiency of these systems is to install them in the vadose zone but to do this efficiently requires accurate quantification of the complex interactions between heat and mass transfer through unsaturated soils. This presentation will discuss how these challenges have been addressed. Results demonstrate that, it is possible to take advantage of phase change and convective heat transfer phenomena to obtain greater heat injection and extraction rates, making the energy storage system more efficient. Linking energy storage systems with environmental remediation technologies such as thermally enhanced bioremediation and thermal remediation is also considered and will be discussed.

To view this poster online, go to <http://www.humboldt.edu/math/news-and-events/math-colloquium>
We cordially invite you to the Pre-Colloquium Tea on the third floor of the BSS
building at 3:30 pm on Thursday.