

# Stephen Bourne, Ph.D. Student

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## Ongoing Research Work

### 1) Small-Scale PCM-based Active Thermal Store

- Designed to reduce peak energy demand
- Developed for the Façade Thermal Lab facility

#### Goals

- Design and construct thermal store
- Integrate with smart-grid capable controls

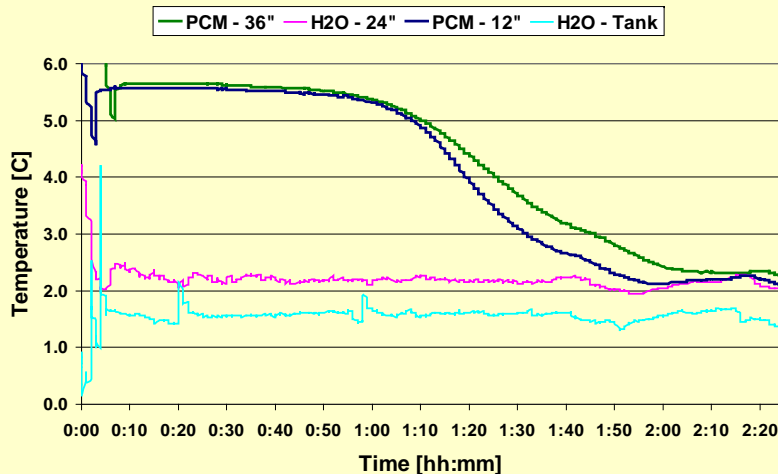
### 2) PCM and Desiccant Integration Into Building Materials

- Allow high-capacity built-in thermal/moisture storage
- Validate using the Façade Thermal lab

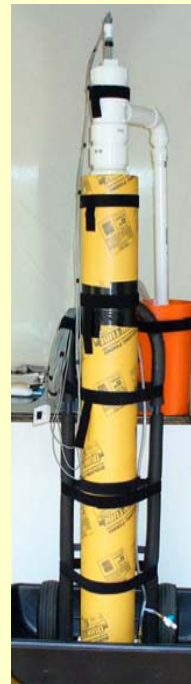
#### Goals

- Quantification of PCM and desiccant performance
- Model PCM & desiccant charge/discharge cycles
- Develop charge & status verification tools
- Integrate controls into EM system

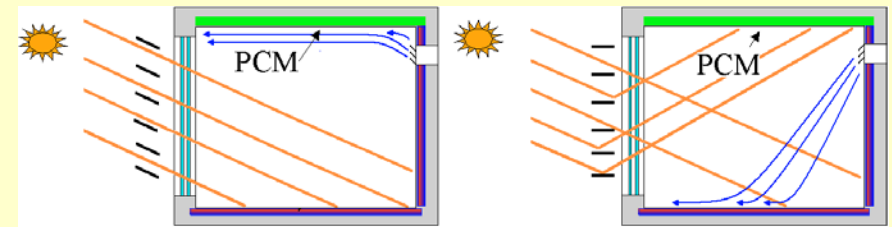
PCM Temperature Log - 2°C Water Bath



PCM water bath freeze cycle test results



PCM test apparatus



Application of active controls for passive ceiling tile PCM



The Thermal Façade Labs at the School of Architecture