# **CATEE 2015**

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An applied research laboratory focused on energy efficiency

- An engineering "Teaching Hospital"
- Develops innovative technologies
- Commercializes affordable results for industry
- Funded by contracts for research and engineering services



## Architectural Engineering



- New undergraduate and graduate degree
  program coming at A&M
- Will offer specialties in HVAC/Mechanical, Electrical/Lighting, and Structures
- Program Director hired: Dr. Morad Atif

### Molecular Membrane Air Conditioner (MMAC)



- Zeolite membrane permits water vapor to pass through - blocks most air passage
  - Acts as a "sieve" for water vapor to dehumidify air without the energy penalty of condensation



### **MMAC** Operation



- A very green process
  - No refrigerants
  - High Efficiency ("SEER"s from 17 to 40+ in future)
  - Cost effective (targeted to eventually cost less than conventional)



#### Status: Bench Prototype Built





#### **Testing Verifies It Works As Expected**

#### **Future Development**



- Supported by
  - DOE Advanced Research Projects Agency Energy ARPA-E
  - Department of Defense
  - U.S. Navy
- Initial Customers Identified
  - U.S. Navy
  - Data Center Dehumidification





- Fundamentally change in the way we dehumidify and cool air
- Completely eliminate use of any
  refrigerants with environmental impacts
- Be more efficient than current technology
- Generate highly pure water
- Ultimately cost less than current technology

