Abstract: This poster will describe how our technical team has developed a novel reserve micro battery architecture based on MEMS processing techniques that mimics one of the observed surface interactions of superhydrophobic properties in structures such as the lotus leaf's ability to repel water, and extends the design to also repel very low surface tension organic liquid electrolytes. This micro/nano structured MEMS silicon surface can be made tunable using electrowetting techniques, to design a new class of power storage devices having very long shelf life capabilities.