



University of Dayton  
Research Institute

|||  
► CAPABILITIES

# SOLID STATE BATTERIES & INTEGRATED SYSTEMS

High safety. High energy.

## SOLID-STATE CERAMIC ELECTROLYTES (SCE) (TRL 1-5)

- Synthesis & Fundamental Studies
- Processing (Small to Large Format)
- Applications (Battery, Capacitor, Ion-exchange)

## SCE COATED LI-ION CATHODES (SCEC) (TRL 1-5)

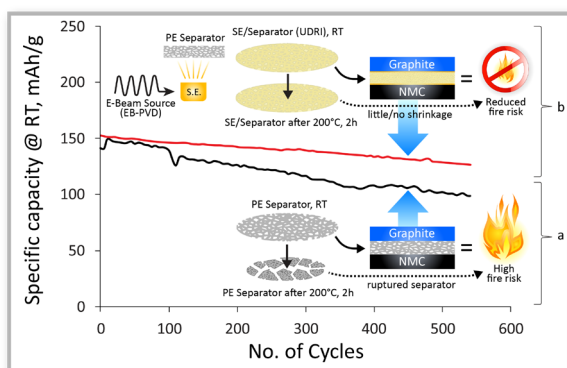
- Thin-film coating (Molecular Scale to Nano-scale)
- Processing (Small to Large Batch)
- Applications (Li-ion Battery)

## TUNABLE CARBON STRUCTURES FOR HIGH ENERGY ANODES (HEA) (TRL 1-5)

- Synthesis & Fundamental Studies
- Processing (Small to Large Batch)
- Applications (Battery, Capacitor, Fuel-cell, water purification, CO2 capture, Catalyst support)

## HIGH SAFETY LI-ION BATTERIES USING SCE, SCEC & HEA (TRL 5-6)

- Custom Li-ion Design, Fabrication, Testing
- Applications Safe Li-ion Batteries (Sensors to Space)
- Temperature (-30°C to 200°C)



## SOLID-STATE PRIMARY BATTERIES (TRL 1-4)

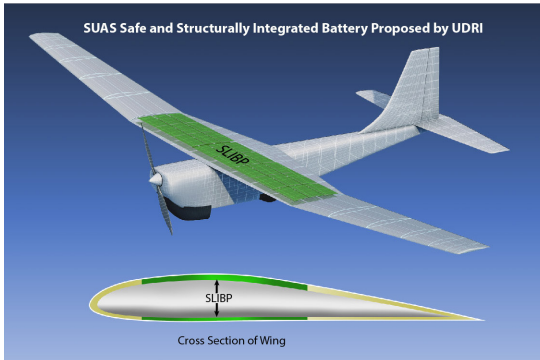
- Novel materials, Synthesis & Fundamental Studies
- Processing (Small to Large Format): 500-700 Wh/kg
- Long Shelf-life (Years)
- Applications (Sensors to Space)
- Temperature (-60°C to 500°C)

## NEXT GEN RECHARGEABLE LI BATTERY (TRL 3-4)

- Novel materials, Synthesis & Fundamental Studies
- Processing (Small to Large Format): 200-400 Wh/kg
- Moderate Cycle-life (>200)
- Moderate Shelf-life (Months to Years)
- Applications (Drones, Dismounted Military, Space)
- Temperature (-30°C to 500°C)

## SUPERCAPACITORS, LI-ION CAPACITORS (TRL 1-4)

- Novel materials, Synthesis & Fundamental Studies
- Processing (Small to Large Format): 10-100 Wh/kg
- Applications (Drones, Space)
- Temperature (-30°C to 100°C)



### STRUCTURAL LI BATTERIES (TRL 1-3)

- Novel materials, Synthesis & Fundamental Studies
- Processing in Structural Formats
- Applications (Drones, Military Vehicles, Space Equipment)
- Temperature (-30°C to 150°C)

### CONFORMAL LI BATTERIES (TRL 1-3)

- Novel materials, Synthesis & Fundamental Studies
- Processing in Flexible Formats
- Applications (Wearables, Drones, Military Vehicles, Space Equipment)
- Temperature (-30°C to 150°C)

### THIN-FILM LI-ION BATTERY (TRL 1-2)

- Novel materials, Synthesis & Fundamental Studies
- Processing in Thin-film Formats
- Applications (Electronics)
- Temperature (-30°C to 150°C)



### CUSTOM BATTERIES & MANAGEMENT SYSTEMS (BMS) (TRL 4-6)

- Custom Li-ion Design, Fabrication (Large Pouch Format)
- Custom BMS
- Battery Module (Voltage as per Applications) Design and Test
- Performance Testing (Any Voltage)
- Safety Testing
- Applications (Batteries for Sensors to Space)
- Test Temperature Range (-70°C to 500°C)

### INDEPENDENT BATTERY PERFORMANCE EVALUATION

- Third party Independent Battery Performance Evaluations
- Identification of Optimal Battery/Capacitor Solutions
- Consultancy on Battery Selection and Use
- Market Research
- Training Material Development
- Classified Program Support
- GSA Contracting Solutions
- ISO-17025 Certification

