BATTERY RESEARCH AT ARGONNE

Material Discovery
Models, Synthesis

Material Characterization
In Situ, Operando

System-level Analysis
Vehicle, Grid, Techno-Economic

Electrode and Cells
Modeling, Characterization

Recycling
Life Cycle, Processing

Material Process
R&D and Scale Up
Organic, Inorganic

Cell Diagnostics and Modeling
Performance, Degradation

Large Format Devices
Pouch, 18650

Standardized Testing
Vehicle, Grid
The ReCell Center: Advanced Battery Recycling

The center will establish cost-effective, flexible processing techniques to extract as much value as possible from current and future batteries chemistries to make recycling economically viable.

Bringing together battery recycling expertise and bridging the gaps between them to efficiently address the many challenges that face a successful advanced battery recycling infrastructure.
JCESR’S FIRST FIVE YEARS…
Focus exclusively on beyond Li-ion batteries

Innovative tools
- Comprehensive simulation of multivalent cathodes and solid state electrolytes
- Stripping and plating mechanisms of multivalent electrolytes
- Versatile redox polymers (redoxmers) for flow battery design
- Machine learning for redoxmer discovery
- Polymer membranes for size and charge separation
- Li-S lean electrolytes and alternate reaction pathways

Frontier Science Advances
- Redoxmer Flow
- Air-Breathing Aqueous Sulfur
- Multivalent Mg++
- Li-Sulfur

Three Startups
- Solid State Electrolytes
- Size-selective polymer membranes
- Air-Breathing Aqueous Sulfur
Vision
Design the battery for the application, not the application for the battery
Batteries satisfy all required performance metrics simultaneously

Mission
Transformative materials, chemistries and architectures for next generation batteries

Approach
Build materials and systems “from the bottom up” atom-by-atom and molecule-by-molecule
Each atom or molecule plays a prescribed role in producing overall materials and systems behavior
Anodes, cathodes, electrolytes, interfaces, architectures