Science & Technology Enablers of a Domestic Extreme Battery Supply Chain

• The United States depends on unreliable foreign sources for lithium, nickel, cobalt, graphite and manganese.

• Development of a domestic extreme battery supply chain is a national security enabler.

• Discovery of alternative materials can be another national security enabler.
Chunsheng Wang
UMD Director, Center for Research in Extreme Batteries (CREB)
Department of Chemical & Biomolecular Engineering
University of Maryland
www.creb.umd.edu

Eric D. Wachsman
Director, Maryland Energy Innovation Institute
www.energy.umd.edu

Jim Short
CREB Program Administrator
Goal: To foster and accelerate collaborative research in advanced battery materials, technologies, and characterization techniques.

Focus: CREB is the only battery center in the US focused on the development of batteries with extreme performance, extreme safety, and extreme environmental capabilities for the defense, aerospace, and biomedical industries.

History: Started as a UMD / ARL research collaboration between Chunsheng Wang and Kang Xu, and a programmatic focus of the Maryland Energy Innovation Institute and the ARL Open-Campus Initiative.

Bi-annual meeting: Convenes academic, industry, and governmental agencies as part of CREB Consortium in major topical biannual meetings at UMD and ARL

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014 Fall (ARL)</td>
<td>Inaugural Meeting</td>
</tr>
<tr>
<td>2015 Spring (UMD)</td>
<td>Steering Committee Formed</td>
</tr>
<tr>
<td>2016 Spring (UMD)</td>
<td>Aerospace &amp; Biomedical Batteries</td>
</tr>
<tr>
<td>2016 Fall (ARL)</td>
<td>Future of Munitions Batteries</td>
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<tr>
<td>2017 Spring (UMD)</td>
<td>Engineering Sustainability</td>
</tr>
<tr>
<td>2017 Fall (UMD)</td>
<td>Biomedical Batteries</td>
</tr>
<tr>
<td>2018 Spring (ARL)</td>
<td>Fast Charging Batteries</td>
</tr>
<tr>
<td>2018 Fall (UMD)</td>
<td>Safe and Wearable Batteries</td>
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<tr>
<td>2019 Spring (UMD)</td>
<td>Electric Flight Batteries</td>
</tr>
<tr>
<td>2019 Fall (UMD)</td>
<td>Aerospace Batteries</td>
</tr>
<tr>
<td>2020 Fall (virtual)</td>
<td>Transformation Army Batteries</td>
</tr>
<tr>
<td>2021 Spring (virtual)</td>
<td>Intelligence Batteries</td>
</tr>
<tr>
<td>2021 Fall (virtual)</td>
<td>Low Temperature Batteries</td>
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</tbody>
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CREB Organization

CREB Steering Committee

UMD: Chunsheng Wang (UMD CREB Director) & Eric Wachsman
ARL: Wesley Henderson (ARL CREB Lead) & Kang Xu
NIST: Joseph Dura & David Jacobson
NYBEST: William Acker
BNL/Stony Brook U: Esther Takeuchi
ANL: Kahlil Amine
SUNY: Stanley Whittingham (Nobel Laureate in Chemistry, 2019)

CREB Consortium

CREB Consortium is comprised of individual, organizational, and industrial members
Defense Appropriations Act
“Center for Research in Extreme Batteries”

Program Administrator
Former Senior Technical advisor to the Assistant Secretary of Defense for Operational Energy; Weapons Staff Specialist for Director, Defense Research & Engineering; Scientific Officer at ONR; Scientific Advisor to the Principal Deputy Director, Defense Research & Engineering; Senior Executive Service appointment as Director of DoD Laboratory Programs in Office of the Secretary of Defense

Jim Short

FY20 Department of Defense Appropriations Act “Center for Research in Extreme Batteries”
$10M

FY21 Department of Defense Appropriations Act “Center for Research in Extreme Batteries”
$10M