

APPENDIX E

Bylaws and Articles of Collaboration of The University of Maryland Center of Research on Extreme Batteries Consortium

Article 1: Name and Purpose

These *Bylaws and Articles of Collaboration* (the “Agreement”) hereby establish the terms and conditions under which Consortium Members to the Center of Research on Extreme Batteries (CREB) Consortium (“Consortium”) agree to operate.

(a) **Purpose.** The Consortium Members have each agreed to participate in this multidisciplinary consortium in order to foster in-depth collaboration among the Members, with an emphasis on the research of battery materials and chemistries that are often unexplored by Department of Energy (DOE) Funding Opportunity Announcements (FOAs), such as batteries of extreme high energy and power densities, extreme safety, extreme working environments (extreme temperature limits, high mechanical impacts and tough abuses), etc. Consortium will cater to the battery needs of specialized areas such as defense, space and bio-/medical applications.

Through its leadership in the science and engineering community, the Consortium can shape:

- Research and development for battery chemistries and technologies, new chemistries of high energy/power densities, high safety, etc.
- Development of instrumentations for in-situ and in-operando observation/investigation of new materials and interphases and understanding aided by computational modeling.

(b) **Objective of Consortium.** It is the overriding objective of the Consortium Members to:

- Establish a collaborative research environment between U.S. Government, Academia, and Industry that conducts innovative computational and experimental research.
- Collaborate with diverse group of scientists to accelerate the infusion of new technologies in support of battery technology requirements.
- Exchange researchers between Consortium members to facilitate the execution of joint research projects.
- Provide educational programs to foster scientific interchange and facilitate transition of new technologies within the technology community.
- Access to unique infrastructure at member organizations

(c) **Articles of Collaboration.** The Consortium Members agree to the following *Articles of Collaboration* to address the various operational aspects of the Consortium.

Article 2: Structure of Consortium

(a) **Academic Lead Member.** UMD shall be the Academic Lead Member of the Consortium. The role of UMD is to lead the Research and Transition Component of the Consortium and manage the overall Consortium Program. In its role as Academic Lead Member, UMD is an accredited advanced degree (PhD)-granting U.S. educational institution well known for world-class research in interdisciplinary science, engineering, and software development.

The Academic Lead Member shall:

- Provide leadership in fulfilling the Consortium vision of identifying and accelerating the infusion of new technologies in energy storage.
- Manage the Consortium research projects as determined by the Steering Committee and the Consortium Advisory Board. Actively solicit opportunities for collaboration between the Consortium and the extended research community.
- Comply with all Consortium reporting requirements including joint papers and presentations, journal articles, and workshop proceedings.
- Promote and utilize “blended” research teams (multi-institution) across the Consortium’s research portfolio.
- Administer and manage the funds collected on behalf of the CREB Consortium.
- Assume responsibility for the management and integration of all the Consortium’s efforts under the Cooperative Agreements or other legal mechanisms.

Options for membership are included as Exhibit A.

Article 3: Membership Term & Termination

Membership is on a yearly basis starting with the calendar year. Membership is subject to applicable fees and/or in-kind contributions. Members are free to leave subsequent years by non-payment of dues and their CREB membership will be revoked along with access to the web site and mailing list. All members agree to return or destroy all other Member proprietary data related to this CREB membership that it has in its possession upon completion or termination of their membership.

Article 4: Organizational and Management Structure of the CREB and the Consortium

(a) CREB prime agencies: ARL, UMD, NIST

(b) CREB steering committee:

Two representatives from each prime agency as well as other representatives as agreed upon by Steering Committee. The Steering Committee’s task is to set up operational processes and to guide the operation and research priorities of the Center. Federal government employee members of the CREB Steering Committee do not have voting rights and will act in an advisory capacity.

(c) CREB Consortium Advisory Board (CAB):

The CAB will consist of 1 (one) voting member from each organization of those participants who pay the threshold fee of the Industrial Leadership membership as well as one voting member from each Sponsoring Agency who have paid the threshold fee of \$80,000. All CAB Members have an equal voice in managing the Consortium research agenda. The CAB will be chaired by the representative from the Academic Lead Member of the CREB Consortium. Federal government employee members of the Consortium Advisory Board do not have voting rights and will act in an advisory capacity.

(d) The CREB Steering Committee and the CAB will determine what research topics will be addressed with Consortium funds. Federal government employee members of the Steering Committee and Consortium Advisory Board do not have voting rights for fund targets, but will act in an advisory capacity.

(e) **Consortium Director.**

- (i) The Consortium Director will be appointed by the Academic Lead Member (UMD). The Consortium Director shall provide leadership and be responsible for management of the overall CREB Program.
- (ii) The Consortium Director has day-to-day responsibilities for the organization, including carrying out the Consortium's goals and objectives. The Consortium Director will attend all meetings, report on the progress of the organization, answer questions of the CREB, and carry out the duties of the Consortium.
- (iii) The Consortium Director carries out multiple responsibilities including serving as a tenured- faculty member at the Academic Lead University, working as a Consortium research principle investigator (PI), and leading the Consortium program with the overall responsibility to the program. The Consortium believes it is very advantageous for the Consortium program for the Director to continue to be a teacher, active researcher, and R&D manager because all three of these responsibilities represent the major Consortium program goals.

Article 5: Strategies for Effective Collaborative Research

(a) It is the overriding objective of the Consortium to:

- Establish a collaborative research environment between Government, Academia, and Industry that conducts innovative novel research.
- Collaborate with consortium scientists to accelerate the infusion of new technologies in support of battery technology requirements.
- Exchange researchers between the Consortium members to facilitate the execution of joint research projects.
- Provide educational programs to foster scientific interchange and facilitate transition of new technologies.
- The Consortium Members address collaborative research issues through various strategies,

including:

- Utilize “blended” research-PI teams that feature PIs and researchers working together on research projects across our entire research portfolio.
- Offer biannual (2 per year) CREB meetings.
- Regularly present research and technology developed within CREB at technical conferences.
- Assist researchers to implement new technologies and techniques developed, or identified by CREB to improve the speed and quality of research.

(b) Types of Collaborative Opportunities:

- (1) Self-funded: This includes non-reimbursable collaborations with in-kind contributions between individuals associated with of CREB, fostered by CREBs meetings and open resources. No- or low-cost general activities that may fall in this category include:
 - Experts' database: Members can contribute information to a secure, web-based database available to all other Members. This will enhance collaborations among Members both on unfunded basis and when applying for grants.
 - CREB External Web Site: This publicly available website will disseminate news and highlights, giving CREB a higher profile and increasing the opportunities for PI level and centrally funded grants. It will also list points of contact and Consortium Members).
 - Workshops: Talks and posters at bi-annual CREB meetings will showcase CREB results and opportunities to attending funding agency program managers, Member organizations (who may sponsor follow-on research) and prospective collaborators within the database of Researchers. Invited talks, and posters, and the number of contributed posters will be determined by the Steering committee on a case by case basis for each meeting.
 - Access to Dry Room and other CREB facilities: Access to CREB Consortium Member facilities will be administered by their respective organizations. Access to ARL facilities will be through a collaborative program. Access to NIST facilities will be through the user proposal systems and / or collaborative access.

(2) Individual Grant Sponsored:

Individual members or groups of members of CREB can write grant proposals to typical funding agencies utilizing the research advantages of membership in CREB, and will list the outcomes under these grants as CREB accomplishments. CREB members have many advantages, listed below, that will help when they write individual PI grant proposals. Results from CREB affiliated grants can be listed as CREB accomplishments.

- (3) Sponsored Research: Larger grants may fund CREB opportunities for targeted research areas.
- (4) CREB Consortium Funded (Seed Funding): Funds generated through membership fees will be available for pre-competitive research topics as selected by the CREB Steering Committee and the CAB.

(c) Meetings and Workshops.

- (1) **Bi-Annual CREB Meetings.** CREB plans to hold two research and innovation conferences per year, described as follows:
 - (2) **Annual CREB Meeting.** This annual meeting will highlight the status of CREB and its programs. All recipients of CREB funds are required to present the results of their programs at this meeting. The location and date will be decided by the CREB Steering Committee.
 - (3) **Annual focused workshop** – An annual workshop will be held focused on a specific CREB topic where needs, status and technology gaps will be discussed. The topic, location and date will be decided by the Industrial Advisory Board and the CREB Steering Committee. The goal is to have discussions on how the technology gaps may be addressed and collaborative opportunities identified to address them. These topics may relate to future CREB funding opportunities.

Article 6: Financial and Administrative Responsibilities

Managing Consortium Finances. The financial matters of the Consortium Program/Consortium will be managed by the Academic Lead Member, UMD, who will be responsible for ensuring that the monies budgeted for the activities of the Consortium will be committed in a timely and expeditious matter. In this capacity, UMD shall also be responsible for:

- Disbursing funds on a timely basis to ensure the success of the Consortium-sponsored research projects and overall management and administration of the Consortium Program.
- Publishing a monthly internal “funds tracking report” for the Steering Committee, CAB, and Grants Officer to track disbursement of program funds.
- Ensuring that within three months of completion of the Annual Performance Plan (APP), all invoices are submitted in connection with that APP.
- Developing and reviewing financial procedures, contracting with the Consortium Members, and supporting the annual budget plan and APP.
- Presenting the budget and planned expenditures to the Steering Committee and the CAB for approval. Federal employees shall serve in an advisory role only.
- Ensuring that annual financial reporting requirements are met and submitted to the board, Consortium Director, Steering Committee and the CAB showing income, expenditures, and committed funds.

Article 7: Intellectual Property

- (a) **Ownership of Research Program Inventions.** Research Program Inventions are inventions conceived, discovered, and reduced to practice by a Consortium Member or its employees, agents, or students in the course of performing projects funded by the CREB Consortium. Unless otherwise required by law, Research Program Inventions will be owned by that Consortium Member (collectively, “Sole Inventions”). Research Program Inventions conceived, discovered, and reduced to practice by at least one employee, agent, or student of

two or more Consortium Members will be owned by these Consortium Members, without any obligation to account to one another (“Joint Inventions”). Inventorship will be determined according to the principles of U.S. patent law. No Member shall make any claim to the other Member’s Sole Inventions.

- (b) **Pre-Existing Rights.** Except to the limited extent required to perform a Member’s obligations under this Agreement, no Member receives (i) any right, title, or interest in or to any research materials provided to it by another Member; or (ii) any technology, works, or inventions of another Member that are not Research Program Inventions; or (iii) any patent, copyright, trade secret, or other proprietary rights in any of the foregoing. Patents will mean those United States and foreign patents and patent applications, including any continuation, reissue, or renewal thereof, or substitute therefore, and the patents that may be issued thereon, relating to any patentable Research Program Invention.
- (c) **Patent Prosecution and Expenses.** Unless the Members agree in writing otherwise, the filing, prosecution, defense, and maintenance of all patents for Joint Inventions, excluding federal partners, shall be conducted jointly in the name of the Members and controlled by them jointly, acting reasonably and in good faith.
- (d) **Licensing.** Each Member will receive a non-exclusive, non-transferable, royalty-free license to use all Research Program Inventions for internal, non-commercial purposes during its Membership in the Consortium. Each Member reserves the right to license its interest in its Sole Inventions or Joint Inventions for commercial purposes, with CREB Consortium Members having right of first refusal for any commercial licensing. If a Member desires to exclusively license its Sole Invention, it shall provide notice to all Consortium Members and agree to negotiate in good faith with the first Member to request an exclusive license. If multiple Members desire to exclusively license an invention, each interested Member shall receive a co-exclusive license.
- (e) **Rights Subject to Federal Patent Policy.** The assignment of title or the granting of any license above is subject to the rights of the Federal Government and Federal law set forth in 15 U.S.C. § 3710a or 35 U.S.C. §§ 200 et. seq., as amended, and the regulations promulgated therein, as amended, or any successor statutes or regulations (the "Federal Patent Policy"). Any right granted in this Agreement greater than that permitted under the Federal Patent Policy will be modified as may be required to conform to the provisions of the Federal Patent Policy.

Article 8: Internal Dispute Resolution

- (a) The Consortium Members recognize that disputes between Members arising under this Agreement are best resolved by the Steering Committee. The Members directly involved in a dispute will use their best efforts in order to reach an equitable resolution.
- (b) The Consortium Members also agree that any dispute arising under this Articles of Collaboration, which is not resolved by the Steering Committee, shall be submitted to the UMD Vice President for Research to determine the appropriateness for employing mediation or non-binding arbitration. Should it be necessary to seek out the assistance of UMD, the Steering

Committee will provide to UMD a full report summarizing the nature of the dispute and a summary of the Steering Committee's previous efforts to resolve the dispute.

Article 9: Handling of Classified and Sensitive Information

- (a) The Consortium Members favor an open-publication policy to promote the commercial acceptance of the technology developed by Consortium Members under this Agreement. However, the Consortium Members also simultaneously recognize the necessity to protect proprietary information. For classified information, the Academic Lead Member does not maintain facilities to support handling of classified information and will not accept information of that nature into the facility environment. Federal government members recognize the importance of protecting all proprietary and classified information and systems from the possibility of being lost or compromised, in accordance with the DOD 5220.22- M, National Industrial Security Program.
- (b) Definition of Sensitive & Proprietary Information. For purposes of this Agreement, Sensitive and/or Proprietary Information is defined as that information in any form that is (i) not generally available to the public, and (ii) clearly marked as "PROPRIETARY – CREB USE ONLY" by the Disclosing Member at the time of disclosure or, if disclosed orally, is identified by the Disclosing Member as proprietary at the time of disclosure, then summarized in a writing marked "Proprietary" furnished by the Disclosing Party within ten (10) business days of the initial oral disclosure.

Proprietary Information means information, including data, that embodies trade secrets exclusively developed at private expense, or business, commercial, or financial information that is privileged or confidential, provided that such information: (i) is not known or available from other sources without obligations concerning its confidentiality; (ii) has not been made available by the owners to others without obligation concerning confidentiality; (iii) is not already available to the Government without obligation concerning its confidentiality; and/or (iv) has not been developed independently by persons who have had no access to the information.

- (c) Protection of Proprietary Information. The Consortium Members agree not to disclose or cause to be disclosed any Member's Proprietary Information (including data to any other person, group of persons, company, organization, association, or corporation without a specific written release furnished by the Member that owns the Proprietary Information. In addition, the Consortium Members agree to utilize any Proprietary Information received under the terms of this Agreement for the sole and express purpose of performance under this Agreement. The Consortium Members further agree to provide at least the same standard of safeguarding for the Member's Proprietary Information as it does for its own.
- (d) Refusal of Proprietary Data. The Consortium Members retain the right to refuse to accept any such Proprietary Information that they do not consider to be essential to the completion of the Project or which they believe to be improperly designated as proprietary.
- (e) Export Controlled Data. Members that plan to disclose export-controlled information shall coordinate appropriate legal transfers among themselves; however, in no event will a

Member share export-controlled information with UMD until the Member is cleared to do so by UMD's Export Compliance Officer (export@umd.edu).

Article 10: Publications and Press Releases

- (a) The basic objective of research activities by the Consortium is the generation of new knowledge and its expeditious dissemination for the public's benefit. Nothing in this Agreement affects the rights of Members to publish papers and make public presentations relating to Consortium research in which that Member is engaged.
- (b) Prior to submission for publication or public presentation of a manuscript, abstract, or presentation (together, "manuscript") describing the results of a Consortium research project, the publishing Member will send a copy of the proposed manuscript to the other Members involved in the Consortium research project. Within ten (10) business days of the non-publishing Member's receipt of the manuscript, the non-publishing Member shall identify, in writing, any specific information in the manuscript that the non-publishing Member identifies as patentable or the non-publishing Member's Proprietary Information.
- (c) Upon receipt of the non-publishing Member's written notice, the publishing Member will delete the Proprietary Information and, if applicable, delay submission of the manuscript for sixty (60) days to permit the non-publishing Member to prepare and file a patent application on the patentable information. After expiration of the delay period or upon the filing of a patent application, whichever occurs first, the publishing Member shall be free to submit the manuscript for publication or presentation.

Article 11: Amending these Articles of Collaboration

This Articles of Collaboration may be amended when necessary by the Steering Committee and the CAB. Proposed amendments must be submitted to the Consortium Director and UMD to be sent out with regular board announcements.

EXHIBIT A - MEMBERSHIP OPTIONS

Individual Membership - \$160 annually

Intended for individuals interested in following CREB activities from academic institutions, federal research laboratories and agencies, industry and the media

Benefits:

- Inclusion in CREB membership list
- Admission to semi-annual CREB member meetings
- Access to CREB Consortium Member facilities in accordance with applicable policies
- Opportunity to participate in CREB collaborations
- Awareness of opportunities to identify and jointly pursue alternative revenue streams in accordance with consortium member organization applicable policies

Organizational Membership - \$2000 or in kind contribution annually

Intended for groups of scientists in academic institutions and federal research laboratories. In kind contributions are limited to man hours, facility usage, and materials provided by a consortium member with a value based on organizational policies and rates (e.g., ARL, NIST, ANL, BNL, ORNL, PNNL, NRL, NSWCCD, JPL)

Benefits:

- Identified as member organization in CREB web site and promotional materials
- Inclusion of up to 15 employees in CREB membership list
- Admission to semi-annual CREB member meetings for those 15 employees
- Access to CREB Consortium Member facilities in accordance with applicable policies
- Opportunity to participate in CREB collaborations
- Awareness of opportunities to identify and jointly pursue alternative revenue streams in accordance with consortium member organization applicable policies
- Non-commercial, non-exclusive, non-transferable, royalty-free license (“NERF”) to use CREB Consortium IP for internal use, which does not include use for products or services intended for commercial purposes. Each Member reserves the right to license its interest in its Sole Inventions or Joint Inventions for commercial purposes, with CREB Consortium Members having right of first refusal for any commercial licensing. If a Member desires to exclusively license its Sole Invention, it shall provide notice to all Consortium Members and agree to negotiate in good faith with the first Member to request an exclusive license.
- Opportunity to receive funding from CREB Consortium sponsored research

Industry-Affiliate Membership - \$1500 annually

Intended for small innovative businesses in need of extreme battery technology or engaged in the development of that technology and its applications

Benefits:

- Identified as Industry member in CREB web site and promotional materials
- Inclusion of up to 5 employees in CREB membership list
- Admission to semi-annual CREB member meetings for those 5 employees
- Access to CREB Consortium Member facilities in accordance with applicable policies
- Opportunity to participate in CREB collaborations
- Awareness of opportunities to identify and jointly pursue alternative revenue streams in accordance with consortium member organization applicable policies
- Ability to review CREB Consortium funded research results and generated IP before publication or patent filing

Industry Membership - \$30,000 annually

Intended for companies in need of extreme battery technology solutions and access to expertise and pre-competitive research results

Benefits:

- Identified as Industry member in CREB web site and promotional materials
- Inclusion of up to 5 employees in CREB membership list
- Admission to semi-annual CREB member meetings for those 5 employees
- Access to CREB Consortium Member facilities in accordance with applicable policies
- Opportunity to participate in CREB collaborations
- Awareness of opportunities to identify and jointly pursue alternative revenue streams in accordance with consortium member organization applicable policies
- Access to expertise of CREB Consortium battery researchers
- Ability to review CREB Consortium funded research results and generated IP before publication or patent filing
- NERF to use CREB Consortium IP for internal use, which does not include use for products or services intended for commercial purposes. Each Member reserves the right to license its interest in its Sole Inventions or Joint Inventions for commercial purposes, with CREB Consortium Members having right of first refusal for any commercial licensing. If a Member desires to exclusively license its Sole Invention, it shall provide notice to all Consortium Members and agree to negotiate in good faith with the first Member to request an exclusive license.
- Input into direction of CREB Consortium sponsored research – through written white papers to CAB

Industry Leadership Member - \$80,000 annually

Intended for Large Businesses in need of extreme battery technology solutions and access to expertise and pre-competitive research results

Benefits:

- Identified as Industry Leader in CREB web site and promotional materials
- Inclusion of up to 5 employees in CREB membership list
- Admission to semi-annual CREB member meetings for those 5 employees
- Access to CREB Consortium Member facilities in accordance with applicable policies
- Opportunity to participate in CREB collaborations
- Awareness of opportunities to identify and jointly pursue alternative revenue streams in accordance with consortium member organization applicable policies
- Access to expertise of CREB Consortium battery researchers
- Ability to review CREB Consortium funded research results and generated IP before publication or patent filing
- NERF to use CREB Consortium IP for internal use, which does not include use for products or services intended for commercial purposes. Each Member reserves the right to license its interest in its Sole Inventions or Joint Inventions for commercial purposes, with CREB Consortium Members having right of first refusal for any commercial licensing. If a Member desires to exclusively license its Sole Invention, it shall provide notice to all Consortium Members and agree to negotiate in good faith with the first Member to request an exclusive license.
- Participation in the CREB Consortium Advisory Board to set direction

Sponsoring Agency Participation - \$20,000 annually

Intended for government agencies (e.g., ONR, AFOSR, NASA, NIH) interested in sponsoring CREB Consortium research

Benefits:

- Identified as Sponsor Federal Agency in CREB web site and promotional materials
- Inclusion of Sponsor representatives in CREB membership list
- Free admission for Sponsor representatives to semi-annual CREB member meetings
- Access to CREB Consortium Member facilities in accordance with applicable policies
- Opportunity to participate in CREB collaborations
- Awareness of opportunities to identify and jointly pursue alternative revenue streams in accordance with consortium member organization applicable policies
- Access to expertise of CREB Consortium battery researchers
- NERF for government purpose
- Additional funding above initial \$20,000 fee can target a specific area of research solicitation or activity such as workshops etc.
- If total contributions exceed \$80,000 the following additional benefits ensue.
 - Participation in the CREB Consortium Advisory Board to set direction