

AIAA ICME Prize

The AIAA ICME Working Group with the support of Composite Design and Manufacturing HUB (cdmHUB), NASA (National Aeronautics and Space Administration), and Rolls Royce Corporation funding have established an ICME (Integrated Computational Materials Engineering) prize for the best aerospace-focused ICME project. This bi-annual award will not only include recognition at SciTech 2022 conference, but will also provide a \$1,500.00 team award. Furthermore, each winning project and project team will be given special consideration for internship or follow-on effort to further realize the benefit of the proposed project with one or more of the sponsoring organizations: cdmHUB, NASA, and/or Rolls-Royce.

2020-2022 ICME Prize Schedule:

- Proposed Project Abstracts due to ICME Award Team – August 24, 2020
 - Submit via email to ICMEprize@gmail.com
 - Abstracts received after the deadline will not be considered
- Acceptance (or rejection) letters to Contestants – October 1, 2020
- Final Project Report due to the ICME Award Team – December 1, 2021
- Each team must give a final presentation at SciTech 2022

Background & Context

ICME (Integrated Computational Materials Engineering) enables “the optimization of the materials, manufacturing processes, and component design long before components are fabricated, by integrating the computational processes involved into a holistic system.” (National Academies Press, 2008).

While recognizing that computational materials is a critical element, the emphasis in this competition should be on the “I” for integrated and “E” for engineering. We seek entries where the key ingredient is the linkage of manufacturing processes to material microstructure, which in turn influence material properties and their variability, thereby enabling tailoring (engineering) of materials to optimize performance for their intended usage. Consequently, it is very important to understand the input, output, and uncertainties at each scale in order to develop rigorous approaches to bridging length and time scales, enable the necessary transfer of information and computational linkages between these scales, and enable a designer/analyst to optimally and confidently achieve their design objectives (performance metrics). The interconnection of these scales along with the development and validation of accurate processing/ microstructure/ property/ performance relationships as well as information management throughout the process are of primary interest. Winning entries will recognize that computational material modeling is a means to an end, but not the end itself.

We are looking for projects that not only demonstrate the above scale linkage with respect to customer performance requirements, but also address specific business benefit. Consequently,

It is anticipated that these projects will be necessarily multi-disciplinary to include cross-supply chain, cross-life cycle, and cross-functional expertise from all relevant disciplines.

Requirements for Participation

It is mandatory that interested participants submit an extended abstract clearly describing the proposed ICME Prize project by the noted 24 August 2020 deadline.

To be considered for participation in the competition, the abstract submission must contain the following information:

1. Names and affiliations of all team members/participants & the team lead
2. Identified customer industry
3. Customer requirements and associated business case
4. A non-confidential description of the proposed project including:
 - a. objectives,
 - b. criteria for success from both a technical and business case standpoint,
 - c. proposed metric(s) to measure success,
 - d. novelty and how the entity or technology developed or utilized will advance the state of the art with respect to ICME, and
 - e. impact to the bottom line business case of the customer.
5. A clear statement of work with associated timeline and required resources.

The ICME Prize selection committee will assess the submitted abstract for completeness per above and send out notifications to submitting teams of acceptance, rejection, or suggested modification to progress to the next project report stage.

Judging Criteria

The AIAA ICME Working Group will assemble an award panel to evaluate each proposed project (based on its own merits) from all accepted projects for the given competition timeframe. Based on all proposed subject matter, at least four AIAA discipline experts along with representatives from each donor organization will be assembled to judge contestant's work. The ICME prize selection committee will evaluate each proposal response against its own described merits, presentation of final project results, and accompanying material.

Contestants will be judge based on the following criteria:

1. Technical scope, difficulty, and quality (35 points)
2. Achievement of stated goals (20 points)
3. Business impact and/or return on investment (15 points)
4. Extent and quality of multidisciplinary team (10 points)
5. Quality of final report (10 points)
6. Quality of final presentation (10 points)