



## MHI and CICMHE Research Funding Program

### **Research Spark Grants**

2019 Guidelines for Proposal  
Preparation and Submission

**Proposal Deadline:** April 1, 2019

These guidelines are modeled after and substantially borrow language from the 2008 version of the National Science Foundation's (NSF) publication: *Proposal and Award Policies and Procedures Guide, Part I - Proposal Preparation & Submission Guidelines*.

# Research Spark Grants

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# Research Spark Grants

## A. Context

MHI has a goal of supporting research and teaching in material handling, logistics, and supply chain as demonstrated through a long-standing commitment to the College Industry Council on Material Handling Education (CICMHE). One critical component of this goal is to develop and support faculty who conduct research on topics that are important to the future of the material handling, logistics, and supply chain industry. To meet this objective, MHI provides a three-part research grant program:

Type 1: Research Start-up Grants

Type 2: Research Spark Grants

Type 3: Research Partnership Grants.

This program influences and supports the work of researchers at different stages in their careers. The intent is to assist in the development of world-class researchers who focus on material handling, logistics, and supply chain as they initiate and perform high-value, high-impact research that is aligned with the needs of the industry.

## B. MHI Spark Grant Program Intent

The MHI Spark Grant targets faculty with a novel research idea with potential high-impact to the material handling, logistics, and supply chain community. The intent of the program is to fund researchers to:

- Launch a high-risk, high-reward research endeavor over a 12 to 18 month horizon;
- Connect with the material handling, logistics, and supply chain industry and to align research objectives with industry needs so that the research results are a win-win;
- Leverage MHI support to gain access to other sources of funds from agencies and/or industry; and
- Train highly qualified researchers at the forefront of the material handling, logistics, and supply chain domain.

The maximum possible budget amount is \$100,000 and, historically, awards range from \$40,000 to \$75,000 depending on proposal quality and relationship to industry needs, as well as on the overall funds available for the program. The principal investigator (PI) will specify the level of funding for which they are applying and delineate their proposed activities, resources, and budget consistent with the requested funding level.

The PI(s) must be tenured or tenure track faculty actively teaching and/or performing research at qualified academic institutions in the U.S.A. or Canada. Co-investigators from around the world are welcome.

## C. Proposal Structure

The proposal should be structured as follows:

- Cover page identifying the project, the PI(s), their institutions, and contact information (not to exceed 1 page)
- Signature of Authorized Organization Representative (AOR)
- Executive summary (not to exceed 1 page)
- Main body of proposal (not to exceed 10 pages)
  - Research context and background
  - Research idea
  - Research goals and objectives
  - Research methodology
  - Research plan
  - Budget and justifications
  - Qualifications of the research team
  - Plans for connecting with material handling & facility logistics industry and/or end users
  - Potential impact on the material handling and facility logistics community
  - Plans for leveraging the Spark Grant funding
  - Plans for training highly qualified personnel
  - Plans for disseminating the research results
- Key references
- Current and Pending Support related to proposal
- When applicable, description of prior research funding from MHI within the last five years, and relationship of the past work with the current proposal
- Curriculum vitae (not to exceed 2 pages for each investigator)
- Letters of support from industry (optional)

MHI/CICMHE seeks well written, clear, and concise proposals. Thus,

- A 10-page limit on the main body of the proposal will be strictly enforced, where the main body is defined above. Proposals with a main body that exceeds 10 pages will be rejected without review.
- The cover page and the executive summary should be first and are limited to one page each. They are not included in the 10-page limit.
- The length and order of all other sections are left as a decision for the PI(s).

The proposal is to be self-contained and must not require referencing external documents, web sites, or other resources. The main body should contain a succinct summary of the research team's qualifications including the most important accomplishments of each member as it relates to successfully completing the research outlined in this proposal. The curriculum vitae will provide additional information and the key publications of the investigators. Letters of support from industry and end users to

be directly involved in the research can be added; however, these letters should be directly and clearly focused on the proposal. Letter of support do not count towards the 10-page limit.

#### **D. Assessment Criteria**

The following criteria are used for evaluating the proposals:

- Potential for contributing to and advancing the material handling, logistics, and supply chain industry
- Academic value of the proposed research
- Feasibility of the research plan given the budget
- Potential for leveraging these funds for larger grants
- Impact of the dissemination plan, and
- Qualifications of the research team.

#### **E. Review, Award, and Contract Process**

MHI/CICMHE strives to conduct a fair, competitive, and transparent merit-review process for the selection of projects using the assessment criteria stated in Section D. Proposals are reviewed by two panels – one from academia and one from industry. Proposals that these panels recommended for funding and the level of support are forwarded to the Chief Executive Officer of MHI who is responsible for making the final award decisions on behalf of MHI/CICMHE and authorizing the expenditure of funds.

No commitment on the part of MHI/CICMHE should be inferred from technical or budgetary discussions with MHI Staff. A PI or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the Chief Executive Officer of MHI does so at their own risk.

MHI reserves the right to reject any and all proposals and to reissue any request for submission of research proposals at any time prior to the execution of a final contract funding a Proposal. MHI may issue addenda to these guidelines and may request additional information or clarification of proposal contents.

When a decision has been made (whether an award or a declination), the PIs will receive a summary of the academic and industry panel discussions. General descriptive information will be available on the MHI/CICMHE website for any proposals receiving support.

Upon notification of selection, funding of proposals will be subject to a separate contract with each participating institution. These will be negotiated *after* the decision to award funding has been made. The agreement will incorporate the provisions of these Guidelines and will also contain additional terms and conditions to be negotiated between the parties. If the parties are unable to agree to the terms of a post-award contract, MHI reserves its right to cancel the funding of the Proposal and to select a different Proposal.

Awardee institutions shall not assign or delegate any investigator responsibilities and shall not transfer any interest in any aspect of the proposal regardless of its status to any other person without the prior written consent of MHI/CICMHE.

#### **F. Proposal Format Specifications**

The following format specifications must be strictly respected. Noncompliant proposals will be rejected without review.

- Each page of the proposal beyond the cover page should be consecutively numbered
- A font size of at least 11 points must be used throughout
- Paper size shall be 8.5"x11" and margins must be at least 1 inch on all sides
- A single-column format must be used for all text with single-space and a six-point spacing between paragraphs, and
- Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. If the document is available electronically, the website address also should be identified.

#### **G. Cover Sheet Specifications**

The major components of the proposal Cover Sheet are as follows:

- (1) Title of Proposed Project
  - The title of the project must be brief, scientifically and technically accurate, and understandable to readers of MHI and other trade publications.
- (2) Budget and Duration Information
  - The budget amount that cannot exceed \$100,000.
  - Grants are normally awarded for a 12 to 18 month period but may be up to two years. PIs are encouraged to request awards for durations of two years only when such durations are necessary for completion of the proposed work and are technically and managerially advantageous.
  - Requested start dates should be during the Fall 2019 term.
- (3) Principal Investigator(s) and Institution(s)
  - A single PI or two co-PIs may be identified.
  - The name and e-mail address of each PI should be provided.
  - The name, address, and Employer Identification Number of the institution or organization of each PI.

#### **H. Executive Summary Specifications**

The executive summary should be suitable for stand-alone publication and must be less than one page in length. The executive summary is not included in the 10-page limit for the

main body. It should not be an abstract of the proposal, but rather a self-contained description of the activity that would result if the proposal were funded.

The executive summary should be informative to readers working in the same or related fields and, insofar as possible, understandable to MHI members. It should notably provide insights relative to the value and impact of the proposed research.

#### **I. Student Involvement Specifications**

Proposals must clearly identify significant involvement of one or more graduate students working with the Principal Investigator(s). The nature of the research work undertaken by the graduate student should be clearly described.

Beyond the minimal requirements for graduate students, the involvement of undergraduate students is welcome.

#### **J. Budgeting Specifications**

Each proposal must contain a budget for each year of support requested. The amounts requested for each budget line item should be documented and justified in the budget justification as described in Appendix A.

#### **K. Current and Pending Support Related to Proposal**

This section of the proposal calls for required information on all current and pending support for ongoing projects and proposals related to the proposed project, including subsequent funding in the case of continuing grants. All current related project support from whatever source (e.g., federal, state, local or foreign government agencies, public or private foundations, industrial or other commercial organizations) must be listed. The total award amount for the entire award period covered (including indirect costs) must be shown as well as the number of person-months per year to be devoted to the project, regardless of source of support. Similar information must be provided for all proposals already submitted or submitted concurrently to other possible sponsors.

#### **L. Guidelines for Projects Involving Human Subjects**

Projects involving research with human subjects must ensure that subjects are protected from research risks. MHI/CICMHE follows the U.S. National Science Foundation (NSF) policy, requiring conformance with the relevant federal policy known as the Common Rule (*Federal Policy for the Protection of Human Subjects, 45 CFR 690*). All projects involving human subjects must either (1) have approval from the organization's Institutional Review Board (IRB) before issuance of an MHI/CICMHE award or, (2) must affirm that the IRB has declared the research exempt from IRB review, in accordance with the applicable subsection, as established in section 101(b) of the Common Rule.

The following information regarding the organization's intention to utilize human subjects as part of the project should be provided on the Cover Sheet:

- The proposal Cover Sheet should clearly indicate the envisioned use of human subjects.

- If human subject activities are exempt from IRB review, provide the exemption number(s) corresponding to one or more of the exemption categories. The six categories of research that qualify for exemption from coverage by the regulations are defined in the Common Rule for Protection of Human Subjects.
- If the research is not designated as exempt, the IRB approval date should be identified in the space provided. This date, at minimum, should cover the period at which the project is initiated. If IRB approval has not been obtained prior to submission, the proposer should indicate "Pending" in the space provided for the approval date.
- Enter the Federal Wide Assurance (FWA) Number that the proposer has on file with the Office of Human Research Protections, if available.

### **M. Reporting Results**

MHI/CICMHE requires that grantees provide an update on the status of their Spark Grant. This update may be provided in many ways including a short document, or a presentation at an MHI/CICMHE meeting or event. Grantees are also strongly encouraged to participate in CICMHE's research colloquium (International Material Handling Research Colloquium) and teachers' institute (Material Handling Teachers Institute).

In order to publicize the accomplishments of grantees to MHI members, the following information is requested from awardees at the completion of the grant:

- General information on research conducted that was supported in some way by this grant
  - General description of the research
  - Publications that were generated
  - Students involved
    - Number of undergraduate and graduate students involved, and
    - Number of UG and G students impacted indirectly;
- Additional external research funding made possible by the MHI grant;
- Information about industry interactions made possible by the research grants
  - Direct involvement by industry
  - Indirect involvement (attended presentation, etc.);
- Dissemination at conferences, tradeshow, and colloquia; and
- Description of how this funding influenced your career and research trajectory.

### **N. Proposal Submission**

The proposal must contain the signature of a duly Authorized Organizational Representative (AOR) of the institution of each principal investigator, who has the power to bind the investigators to the requirements, terms and conditions in these Guidelines. Proposals submitted without such authorized signatures may, in MHI's sole discretion, be rejected without further consideration.



If multiple universities are involved, MHI requests that one of the following two mechanisms be used:

- 1) One university serves as the lead and subcontracts with the other universities. Here, the lead institution submits the Authorized Organization Representative (AOR) signature and no other AOR signatures are required.
- 2) A collaborative proposal is submitted like an NSF Collaborative Proposal. Here, a single technical proposal is submitted by the lead university, but each participating university submits a separate budget with their AOR's signature.

An electronic version of the proposal must be provided in PDF format as a single file. The electronic version should be emailed to Viche' Thomas ([vtthomas@mhi.org](mailto:vtthomas@mhi.org)).

## **O. Withdrawals and Non-Award Decisions**

### Proposal Withdrawal

A proposal may be withdrawn at any time before a funding recommendation is made. Withdrawals may be initiated by the PIs or the organization(s) Sponsored Projects Office (SPO). In the case of collaborative proposals, all PIs or SPOs must support the request before the entire proposal is withdrawn. Portions of the collaborative proposal that are not withdrawn may have an opportunity to be reviewed following consultation with the CICMHE Managing Director.

MHI/CICMHE must be notified if any funding for the proposed project is received from another source or sponsor. If it is brought to MHI/CICMHE's attention that funding for a proposal has been accepted from another sponsor, MHI/CICMHE will send a notice of pending withdrawal to the PI and the SPO, providing thirty (30) days to respond. Any response must demonstrate why such funding is justified and does not duplicate funding provided by MHI/CICMHE.

MHI/CICMHE provides notice of a withdrawal, return, declination, or reconsideration to both the PI and the SPO.

### Return Without Review

Proposals may not be considered, leading to its return without review for the following reasons:

- Inappropriate for funding by MHI/CICMHE;
- Submitted with insufficient lead-time before the activity is scheduled to begin;
- Duplicate of, or substantially similar to, a proposal already under consideration from the same submitter;
- Does not meet proposal preparation requirements, such as page limitations, formatting instructions, and electronic submission, as specified in this guide;
- Does not meet an announced proposal deadline date;
- Previously reviewed and declined and has not been substantially revised; and
- Duplicates another proposal that was already awarded.

### Declinations

A PI whose proposal for support has been declined will be provided feedback from the panel reviews.

### Resubmission

A declined proposal may be resubmitted, but only after it has undergone substantial revision. A resubmitted proposal that has not clearly addressed the major comments or concerns from the prior review may be returned without review. MHI/CICMHE will treat the revised proposal as a new proposal, subject to the standard review procedures.

### **P. Deadline**

Proposals are due by April 1, 2019 at 5:00 p.m. ET.

### **Q. Primary MHI/CICMHE Contact**

All questions, requests for clarification, and requests for additional information about this request for research proposals must be submitted via e-mail to Viche' Thomas (vthomas@mhi.org ). No written or oral response by any other employee or agent of MHI or CICMHE shall be binding or shall in any way constitute a change to these Guidelines or a commitment by MHI or CICMHE. If a Proposer finds any inconsistency or any ambiguity in these Guidelines of this RFP, the Proposer should notify MHI via this primary contact.

An electronic version of the proposal must be provided in PDF format as a single file. The electronic version should be emailed to Viche' Thomas (vthomas@mhi.org ).

## **Appendix A: Budget Specifications**

Each proposal must contain a budget for each year of support requested, this for each selected budgeting option. The amounts requested for each budget line item should be documented and justified in the budget justification.

The proposal may request funds under any of the categories listed below so long as the item and amount are considered necessary, reasonable, allocable, and allowable under the applicable cost principles. Amounts and expenses budgeted also must be consistent with the proposing organization's policies and procedures and cost accounting practices used in accumulating and reporting costs.

When there are two co-principal investigators from distinct institutions, the budget should have a column for each institution and a total column.

### **(1) Salaries and Wages**

The exhibit at the end of this document provides definitions for each category of personnel that have to be explicitly accounted for in the budget.

The names of the PI(s), faculty, and other senior personnel and the estimated number of full-time-equivalent academic-year, summer, or calendar-year person-months for which funding is requested and the total amount of salaries requested per year must be listed. For postdoctoral associates and other professionals, the total number of persons for each position must be listed, with the number of full-time-equivalent person-months and total amount of salaries requested per year. For graduate and undergraduate students, secretarial, clerical, technical, etc., whose time will be charged directly to the project, only the total number of persons and total amount of salaries requested per year in each category is required. Salaries requested must be consistent with the organization's regular practices. The budget justification should detail the rates of pay by individual for senior personnel, postdoctoral associates, and other professionals.

The budget may request funds for support of graduate or undergraduate research assistants to help carry out the proposed research. Compensation classified as salary payments must be requested in the salaries and wages category.

As a general policy, MHI/CICMHE recognizes that salaries of faculty members and other personnel associated directly with the project constitute appropriate direct costs and may be requested in proportion to the effort devoted to the project. Individuals included on salaries/wages budget lines should be employees of the proposing institution(s). These lines should not include compensation related to consultants or sub-awardees.

MHI/CICMHE regards research as one of the normal functions of faculty members at institutions of higher education. Compensation for time normally spent on research within the term of appointment is deemed to be included within the faculty member's regular organizational salary.

Grant funds may not be used to augment the total salary or salary rate of faculty members during the period covered by the term of faculty appointment or to reimburse faculty members for consulting or other time in addition to a regular full-time organizational salary covering the same general period of employment.

Up to one month of summer salary may be budgeted for faculty members at colleges and universities on academic-year appointments.

In most circumstances, salaries of administrative or clerical staff are included as part of indirect costs (also known as Facilities and Administrative Costs (F&A) for Colleges and Universities). Salaries of administrative or clerical staff may be requested as direct costs for a project requiring an extensive amount of administrative or clerical support and where these costs can be readily and specifically identified with the project with a high degree of accuracy. Salaries for administrative or clerical staff shall be budgeted as a direct cost only if this type of cost is consistently treated as a direct cost in like circumstances for all other projects and cost objectives. The circumstances for requiring direct charging of these services must be clearly described in the budget justification. Such costs, if not clearly justified, may be disallowed.

## **(2) Fringe Benefits**

If the proposer's usual accounting practices provide that its contributions to employee benefits (social security, retirement, other payroll-related taxes and time off including vacation, sick, and other leave, etc.) be treated as direct costs, grant funds may be requested to fund fringe benefits as a direct cost. These are typically determined by application of a calculated fringe benefit rate for each class of employee (full time or part-time) applied to the salaries and wages requested.

## **(3) Equipment**

Equipment is defined as an item of property that has an acquisition cost of \$5,000 or more (unless the organization has established lower levels) and an expected service life of more than one year. It is important to note that the acquisition cost of equipment includes modifications, attachments, and accessories necessary to make the property usable for the purpose for which it was purchased. Items of needed equipment must be adequately justified, listed individually by description and estimated cost.

Allowable items ordinarily will be limited to research equipment and apparatus not already available for the conduct of the work. General-purpose equipment, such as a personal computers and office furnishings, are not eligible for support.

## **(4) Travel**

Travel and its relation to the proposed activities must be specified and itemized by destination and cost. Funds may be requested for fieldwork, attendance at meetings and conferences, and other travel associated with the proposed work, including subsistence. In order to qualify for support, however, attendance at meetings or

conferences must be necessary to accomplish proposal objectives or disseminate its results. Allowance for air travel should not exceed the cost of round-trip, economy airfares.

#### **(5) Participant Support**

Costs of transportation, per diem, stipends and other related costs for participants or trainees (but not employees) are allowed in connection with MHI/CICMHE-sponsored conferences, meetings, symposia, training activities and workshops. For some educational projects conducted at local school districts, however, the participants being trained are employees. In such cases, the costs must be classified as participant support if payment is made through a stipend or training allowance method. The school district must have an accounting mechanism in place (i.e., sub-account code) to differentiate between regular salary and stipend payments. Generally, indirect costs (F&A) are not allowed on participant support costs. The number of participants to be supported must be entered on the proposal budget. These costs also must be justified in the budget justification section of the proposal.

#### **(6) Other Direct Costs**

Any costs proposed to a grant must be allowable, reasonable and directly allocable to the supported activity. The budget must identify and itemize other anticipated direct costs not included under the headings above, including materials and supplies, publication costs, computer services, consultant services, and tuition. Examples include aircraft rental, space rental at research establishments away from the grantee organization, minor building alterations, payments to human subjects, service charges, and construction of equipment or systems not available off the shelf. Reference books and periodicals may be charged to the grant only if they are specifically allocable to the project being supported.

##### **a. Materials and Supplies**

The proposal budget justification should indicate the general types of expendable materials and supplies required. Materials and supplies are defined as tangible personal property, other than equipment, costing less than \$5,000, or other lower threshold consistent with the policy established by the proposing organization. Cost estimates must be included for items that represent a substantial amount of the proposed line item cost.

##### **b. Publication/Documentation/Dissemination**

The proposal budget may request funds for the costs of documenting, preparing, publishing or otherwise making available to others the findings and products of the work conducted under the grant. This generally includes the following types of activities: reports, reprints, page charges or other journal costs (except costs for prior or early publication); necessary illustrations; cleanup, documentation, storage and indexing of data and databases; development, documentation and debugging of software.

c. **Computer Services**

The cost of computer services, including computer-based retrieval of scientific, technical and educational information, may be requested only where it is institutional policy to charge such costs as direct charges. A justification based on the established computer service rates at the proposing organization must be included. The proposal budget also may request costs for leasing of computer equipment. General purpose (word processing, spreadsheets, communication) computer equipment should not be requested. Special purpose or scientific use computers or associated hardware and software, however, may be requested as items of equipment when necessary to accomplish the project objectives and not otherwise reasonably available.

d. **Sub-awards**

Except for the procurement of such items as commercially available supplies, materials, equipment or general support services allowable under the grant, no significant part of the research or substantive effort under a grant may be contracted or otherwise transferred to another organization without prior MHI/CICMHE authorization. The intent to enter into such arrangements must be disclosed in the proposal, and a separate budget should be provided for each sub-awardee, if already identified, along with a description of the work to be performed. Otherwise, the disclosure should include a clear description of the work to be performed, and the basis for selection of the sub-awardee (except for collaborative/joint arrangements).

e. **Other Costs**

Any other direct costs not specified above must be itemized, detailed and justified in the budget justification.

**(7) Indirect Costs**

Indirect costs are also known as Facilities and Administrative Costs (F&A) for Colleges and Universities. *MHI/CICMHE's total applicable indirect cost rate is 25%.* The amount for indirect costs should be calculated by applying the indirect cost rate to the approved base.

**(8) Cost sharing**

There is no expectation that proposals submitted for funding will include a cost-sharing component. When cost sharing is included, it is solely at the discretion of the proposing institution but may be a distinguishing or supporting factor in the decision to make an award. However, when cost sharing is proposed, and the proposal is accepted, the commitment of funds becomes legally binding and is subject to audit.

Failure to provide the level of cost sharing reflected in the approved grant budget may result in termination of the grant, disallowance of grant costs and/or refund of grant funds to MHI/CICMHE by the grantee.

**(9) Unallowable Costs**

The following categories of unallowable costs are highlighted because of their sensitivity:

**a. Entertainment**

Costs of entertainment, amusement, diversion and social activities and any costs directly associated with such activities (such as tickets to shows or sporting events, meals, lodging, rentals, transportation and gratuities) are unallowable. Travel, meal and hotel expenses of grantee employees who are not on travel status are unallowable. Costs of employees on travel status are limited to those allowed under the governing cost principles for travel expenses.

**b. Meals and coffee breaks**

No MHI/CICMHE funds may be spent on meals or coffee breaks for intramural meetings of an organization or any of its components, including, but not limited to, laboratories, departments and centers.

**c. Alcoholic beverages**

No MHI/CICMHE funds may be spent on alcoholic beverages

## **Appendix B: Definitions of Categories of Personnel**

Personnel categories to be differentiated in the Proposal Budget are defined as follows:

### **A. Senior Personnel**

1. Principal Investigator or Co-Principal Investigator(s) -- the individual(s) designated by the grantee and approved by MHI/CICMHE who will be responsible for the scientific or technical direction of the project. If more than one, the first one listed will have primary responsibility for the project and the submission of reports.
2. Faculty Associate (faculty member) -- an individual other than the Principal Investigator(s) considered by the performing institution to be a member of its faculty or who holds an appointment as a faculty member at another institution, and who will participate in the project being supported.

### **B. Other Personnel**

1. Postdoctoral Scholar -- An individual who has received a doctoral degree (or equivalent) and is engaged in a temporary and defined period of mentored advanced training to enhance the professional skills and research independence needed to pursue his or her chosen career path. Postdoctoral scholars not identified under Senior Personnel above should be listed as Other Personnel.
2. Other Professional -- a person who may or may not hold a doctoral degree or its equivalent, who is considered a professional and is not reported as a Principal Investigator, faculty associate, postdoctoral scholar or student. Examples of persons included in this category are doctoral associates not reported under B1, professional technicians, physicians, veterinarians, system experts, computer programmers and design engineers.
3. Graduate Student (research assistant) -- a part-time or full-time student working on the project in a research capacity who holds at least a bachelor's degree and is enrolled in a degree program leading to an advanced degree.
4. Undergraduate Student -- a student who is enrolled in a degree program (part-time or full-time) leading to a bachelor's or associate's degree.
5. Non-research personnel -- include persons working on the project in a non-research capacity, such as secretaries, clerk-typists, draftsmen, animal caretakers, electricians and custodial personnel regardless of whether they hold a degree or are involved in degree work.

Any personnel category for which funds are requested must indicate, in the parentheses provided on the Proposal Budget, the number of persons expected to receive some support from those funds and, where called for in the budget format, person-months to the nearest tenth.