JCATI 2022-23 Request for Proposals

Proposal Due Date: Friday, February 25, 2022, 5 PM PST

General Information

Program Summary

The Joint Center for Aerospace Technology Innovation (JCATI) is a Washington state (WA) aerospace industry economic development program. The WA legislature requires JCATI funds to be used for:

- Transitioning innovative technologies into aerospace industry production and use
- Providing WA engineering students with direct aerospace industry exposure
- Increasing WA aerospace industry employment opportunities

JCATI provides short term funding via academic collaboration for WA aerospace companies of all sizes to test and transition promising new technologies. The academic partner receives JCATI funding to work on the technology problem while the industry partner provides project support (in-kind and/or funding) necessary for project completion and transition. JCATI funds are not long-term grants or basic research support. Projects must have a transition plan so the company is positioned to take over the project.

JCATI prefers to fund projects with Technology Readiness Levels (TRL) 4-7 referred to as the "Valley of Death." JCATI's purpose is to help WA aerospace companies bridge this gap to remain competitive. TRL definitions can be found under Application Forms on the [JCATI funding page](#). Interested industry partners can contact engineering faculty directly or can ask the JCATI Program Manager to help identify potential academic partners. If you need matchmaking help, contact the Program Manager no later than January 28, 2022. This allows time to find a match and create a competitive proposal.

The JCATI program is committed to diversity, equity and inclusion for all project participants. We envision JCATI projects as opportunities to become part of the aerospace field regardless of gender identity, race and ethnicity. A diverse aerospace workforce enhances collaboration and the creation of new ideas for the aerospace industry, our universities, and Washington State.

Application forms, FAQ, best practices, and application checklist can be found on the [JCATI funding page](#)

Program Contact: Beth Hacker, JCATI Program Manager, bhacker@uw.edu.

Award Information

- Estimated number of awards for 2022-23: 12-15
- Award amount: $50,000-$115,000
- For 2022-23, JCATI anticipates ~$1.3M in funding.
- Project award period is 1 year: July 1, 2022 to June 30, 2023.
- JCATI funds must be spent by June 30, 2023. No cost extensions are not allowed. Any unspent funds are returned to the state.
- JCATI funds are not subject to indirect rates.
- Awardees are required to present projects at the April 2023 JCATI symposium
- Final report with information from both academic and industry partners is due by July 15, 2023.

- New for 2022-23: Applicants can request an additional $5k to meaningfully involve undergraduates as part of the JCATI Undergraduate Scholars Program (USP). Directions in Section III.D.
- New for 2022-23: Projects addressing critical materials + clean energy challenges can request an additional $25k funding from JCDREAM. Directions in Section III.E.

Eligibility Requirements

- Applicant Organization: Eligible applicant organizations are Central Washington University, Eastern Washington University, Evergreen State College, University of Washington, Washington State University and Western Washington University.
- Principal Investigator: The principal investigator (PI) and any co-investigators must be employed by the applicant organization's College or School of Engineering. Principal investigators must meet their employer's requirements for such status.
  - UW Applicants
    - UW does not allow postdocs to be PIs.
    - Applied Physics Laboratory (APL) researchers and staff are not eligible
- Industry Partners: as JCATI is funded by the WA Legislature, projects must directly benefit the state, its organizations and constituents. The primary industry partner, majority of work and project impact <u>must</u> occur in WA. Organizations outside WA are permissible if above conditions are met.
- Previously funded JCATI projects must reapply and undergo the review process. The PI must demonstrate sufficient progress and clearly explain why another year of funding is needed.
- PI may submit multiple applications but JCATI only funds one proposal per PI.

Management and Ownership of Intellectual Property

- JCATI funded projects have successfully transitioned technology to businesses across the aerospace spectrum. Each academic institution has mechanisms in place regarding intellectual property including [UW](#) and [WSU](#) licensing options. We <u>strongly advise</u> you and your industry partner discuss your project with the appropriate contact below:
  - University of Washington: Erin Schwartz (erinlisa@uw.edu) Senior Director, Corporate & Foundation Relations
  - Washington State University: Brian Kraft (bkraft@wsu.edu) Assistant VP, Office of Research Advancement & Partnerships
  - Western Washington University: David Patrick (david.patrick@wwu.edu) Interim Vice Provost for Research

- Proposal abstracts are not released without academic and industry partner permission.

Types of Supported Projects

- <u>Projects must be WA State aerospace industry related with project impact occurring in WA</u>.

  JCATI interprets aerospace broadly and relevant areas include but are not limited to:
  - Aerospace materials: metals, composites, 3D printed, novel manufacturing processes
  - Aerospace propulsion: battery technologies, clean propulsion technologies, zero-emission air mobility
  - Aerospace sustainability: biofuels, composite recycling, environmentally friendly manufacturing techniques
  - Aircraft configuration design: aerodynamics, distributed propulsion/sensing/actuation, aircraft health monitoring systems, digital twins

- o Aircraft or spacecraft power systems: power distribution systems; hybrid power generation and management
- o Airport transportation modernization: ground transportation, baggage handling, air traffic management, air transportation safety, sustainable aviation, cargo distribution, touchless technologies, safe use of robotics and autonomy
- o Communications systems: aircraft, satellite/space communication
- o Controls and autonomy: aircraft or space systems
- o Human-machine interfaces: pilot training, display design, human fatigue modeling
- o Manufacturing and production innovation: robotics, additive manufacturing, augmented/virtual reality
- o Safety technology or diagnostic tools for passengers and/or aerospace workers
- o Software: machine learning, cybersecurity, AI for aerospace applications
- o Space: spacecraft, CubeSats, imaging, environmental monitoring and space-borne sensing
- o UAV systems: navigation, power, materials, autonomy, software
- o Advanced air mobility: propulsion, infrastructure, planning, network models, materials

- Preference is given to projects with high probability of technology transitioning to the industry partner within 1-2 years (preferably sooner). JCATI funding is not appropriate for basic research projects.
- Industry partners must provide project support (cash and/or in-kind) which can include materials, consulting time, machinery access, computing time, testing facilities, etc. Applications must include letter of support documenting technology need and support amount. Industry partners are encouraged to find ways to involve students in the technology transition.
- The academic partner uses JCATI funds for student salaries, equipment, laboratory fees, materials, etc. All expenditures must follow fiscal best practices set by their institution. JCATI funding can augment the PIs current industrially-sponsored research.

JCATI Proposal Preparation and Submission Instructions

- Use Arial 10-point font size and 1" margins. Figure captions can use smaller font size.
- Use plain language understandable to a lay audience.
- Application size limit=4 MB
- **UW applicants: JCATI applications do not require an eGC1. Do not submit applications to OSP!**
- Applicants must include disclosures of any financial or tech transfer interests held in industry partners in the application packet.
- UW Aero & Astro applicants: your project budget must be completed and signed off by AA grant staff no later than 5 PM Friday Feb 18.

Submit the application no later than Friday, February 25, 2022 at 5:00 PM (PST). Upload the application as a single PDF using the website Online Application Form under Application Forms. Submissions are time stamped upon receipt and late proposals will not be reviewed. Only proposals submitted via JCATI website will be accepted. Do not send your proposal to the JCATI Program Manager. The JCATI Program Manager will confirm application receipt.

The JCATI proposal must include the following elements <u>in order</u>:

I. Application Cover Sheet

Complete the 2022 Cover Sheet found under Application Forms on the funding webpage.

II. Non-Technical Abstract (1-page, 150-word limit)

Clearly and succinctly state the project objective(s), deliverable(s) and impact in accordance with JCATI's purpose.

*** Most common reviewer complaint: I can't tell what industry problem they are solving! ***

DO:
- Make it clear. If a non-scientist read the abstract, could they tell you the industry pain point?
- Keep it short and simple-specific details are for the narrative.
- Put yourself in reviewer's shoes-do they know what to expect moving forward?

DON'T:
- Be vague: "we will work on an important industry problem", "we will help industry meet their goals"
- Be super granular-specific details go in the proposal
- Be hyper technical or rely on acronyms
- Use a previous grant or manuscript abstract
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III. Narrative (5 single-spaced pages total for sections A-C)

Direct the narrative to an educated lay audience outside your field. All figures are included within the page limit. Provide sufficient information for reviewers to evaluate the scientific merit and benefit to the WA aerospace industry independent of any other document. Note that references are listed in Section IV. **Include the following sections in order, each with the section title.**

A. Technical Merit and Project Feasibility (<u>2 pages total for sections A.1-A.3</u>)

1. <u>Technical Background and Approach</u>
Clearly describe your industry partner's pain point and technology need. Here you are expanding on the abstract, providing technical details to the problem. Include the current TRL level and why it was chosen. If the project is a continuation from a previous year, briefly state why another year of JCATI funding is necessary.

DO:
- Build off the abstract to fill in the pain point technical details. If helpful, include graphs/diagrams/pictures
- Clearly state the industry partner issue and technology gap
- Be honest with your TRL level. TRL level descriptions are listed under Application Forms.

DON'T:
- Provide a long historical overview of the technology sector or industry partner
- Discuss your own research needs
- Inflate the TRL level
- Skip including the TRL level
- Be vague about the industry problem or technology need

2. <u>Objectives, Outcomes, Deliverables</u>
Clearly list specific project objectives, anticipated outcomes and deliverables as required by the industry partner. How will you solve your industry partner's technology problem?

DO:
- Be specific: what technique(s) or equipment will you use to address the pain point and how will you do it?
- Use bullet points, bolding, diagrams or figures to make project deliverables clear
- Get technical! This is the place for details

DON'T:
- Say "we will help solve the issues around this problem"
- Say "we will work with the company to address issues"
- Propose solutions beyond the project scope
- Propose solutions that don't address the pain point

3. <u>Technical Innovation</u>.
Describe how the academic partner's expertise will solve the industry partner's technology need. Explain how the proposed innovation affects the industry partner processes.

DO:
- Explain why your lab can successfully address the industry problem. Why is the company partnering with you to solve this problem?
- Tell us if the project involves new application of current techniques
- Tell us if the project involves new techniques

DON'T:
- Copy sections from your NSF grant
- Give your career history
- Extensively mention previous unrelated projects or funding
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NOTE: limit of 2 pages total for sections A.1.-A.3. Wisely use the space to explain why this JCATI project is important and why you are the one to tackle it!

4. <u>Need for JCATI funds.</u>
Describe why this project is suited to the one-year JCATI funding mechanism in comparison to other options such as NSF or industry sponsored projects.

DO:
- Explain how you and your industry partner benefit from addressing this problem within the year timeframe.
- Explain why this particular type of funding instead of other collaboration methods.

DON'T:
- Be vague
- Skip the section

5. <u>Other Sources of Funding</u>
List other funding and/or facilities that could be leveraged for project success.

DO:
- Briefly mention specific projects or funding directly applicable to the project
- Include facilities or other partnerships which contribute to project success

DON'T:
- List all of your grants with their award amounts
- List your entire research portfolio
- Say you will apply for future funding that isn't relevant to the project
- Say you will apply for future funding but you really don't intend to

B. Industry Partnership and Transition Plan
1. <u>Industry Partner Support</u>
Describe the type and cash equivalent value of industry project support. Support can be cash, materials, consulting time, computing time, machining time, etc. At project end, the JCATI Program Manager will verify support delivery. Failure to deliver the proposed level of partner support is considered during future project application review.

DO:
- List the dollar amounts and breakdown of services ($10,000 for consulting and $15,000 in materials for a total of $25,000)
- Double check that the amounts in the narrative and the letter of support match

DON'T:
- Use vague language: " company will provide support as needed "
- Say the details are in the industry letter of support
- Omit the industry support

2. Partners and Roles
Describe how each partner will manage their part of the project
Faculty: how will you contribute to project success? Student involvement, timeline adherence, budget, etc.
Industry: how will you contribute to project success? Provide necessary data, project meetings, validation, factory visits, tech staff involvement, etc. Include the name(s) of the industry lead (s).

DO:
- Make it clear how both partnersl interact for project success and transition
- If helpful, use diagrams to show relationships and responsibilities

DON'T:
- Be vague: "transition will occur at the end of the project'
- Leave the transition responsibility to just one partner
- Say "we will work with our industry partners to transition the technology"

3. Technology Transition Plan
Provide a project plan and/or timeline written with the industry partner describing the project endpoint, intermediate milestones, academic partner exit and incorporation or further testing of the project technology by industry partner. How will the deliverables listed in Section A.2. move from the academic lab completely back to the industry partner within 1-2 years (preferably less)?

DO:
- List milestones to match the deliverables
- Use a timeline or chart to illustrate the transition
- Use figures if appropriate
- Make sure both partners agree on the initial plan

DON'T:
- Be vague: "we will share results with our industry partners"
- Say the transition will happen in 5 years
- Ignore developing a plan with your industry partner
- Say "at project end the technology will move to the industry partner" without details

C. WA Economic and Educational Impact
1. Business Opportunities and Job Benefits
Describe how solving the pain point benefits the industry partner. Include any measurable job creation or fiscal benefits resulting from the technology. Is there a WA business opportunity the technology opens up or improves?

DO:
- Include any potential spinoff or jobs creation information
- Include relevant company information: expansion, new market or customers, upcoming projects based on the technology
- Include SBIR info if relevant to this project
- Tell us if industry partner is a startup company

DON'T:
- Say you will apply for SBIR or other business grants if you really don't intend to
- Say the technology will create thousands of jobs without examples
- Say the technology will "make a difference for WA aerospace" without examples
- Inflate the market impact of the technology

2. <u>Educational, Internship and Job Opportunities</u>
Describe how the JCATI project benefits WA engineering students working on the project. This can be through internships, job opportunities, mentoring, soft skills development, networking, community or student outreach, etc.

DO:
- Include real opportunities for industry student internships or mentoring
- Include specific industry interactions scheduled during the project
- Include any outreach interactions if known

DON'T:
- Inflate company internship or mentoring opportunities
- Say you will involve students and not provide a plan

OPTIONAL Section D: Undergraduate Scholars Program (1-page limit, $5000 max)

To increase undergraduate research participation, JCATI started the Undergraduate Scholars Program (USP). The USP intends to create meaningful opportunities for undergraduate students-including historically underrepresented groups-to enter and thrive in the engineering and research community. Strong applications will clearly indicate how the proposal expands access and participation for all students and contributes to a well-rounded, highly-skilled, and diverse engineering workforce. Student participation can be for a defined period (summer, part of academic year) or over the entire project. Funds must be spent by June 30, 2022. USP. Do not include USP in your project budget form as it is an optional supplement.

If interested, provide the following information:
Describe the recruitment and selection of USP students
Describe the role USP students will have in your project and how the additional funding will be used.

OPTIONAL Section E: Potential Collaboration with JCDREAM via CHARGE (1-page limit, $25,000 max)

The Joint Center for Deployment & Research in Earth Abundant Materials [(JCDREAM)](#) is a WA legislature funded program focused on next-generation clean energy and transportation technologies. To advance critical materials and clean energy technology research, JCDREAM created the Consortium for Hydrogen and Renewably Generated E-Fuels [(CHARGE)](#). The goal is to accelerate deep decarbonization by sustainable green energy based on WA earth abundant materials.

The JCDREAM funds augment the JCATI award to push innovation in the area of critical materials + clean energy. Technologies include chemical catalysts, electrochemical conversion, hydrogen and e-fuel management, systems management and sustainable materials development. By leveraging both programs, we can help make WA a leader in this new economy. JCDREAM will review applications separately for additional funding consideration. Do not include JCDREAM in your project budget form as it is an optional supplement.

Questions on project suitability? Contact JCDREAM Director Aaron Feaver (aaron.feaver@wsu.edu)

If interested, provide the following information:
Describe how additional funds enhance your JCATI proposal technology
Describe how additional funds will be used

IV. References and Reviewer Suggestions (1-page limit)
1. References-List all references from Sections A-C here.
2. Reviewer Suggestions (optional): Provide names and contact information of potential reviewers.

DO:
- Check if your potential reviewer can participate in external review. Some companies do not allow this.
- Provide reviewer contact information

DON'T:
- Provide a name without contact information
- Provide a name without first checking with the person
- List your industry partner as a reviewer
- List your academic collaborator as a reviewer

V. Industry Letters of Support

Each industry partner provides a letter of support (LOS) outlining their project support and involvement. At project end, industry partners must verify delivered support amount. LOS should include the following:

- Name of industry contact and project role
- Type of support and its cash equivalent value. Support may be in the form of, but not limited to: cash, materials, facility access, testing services, consulting time, student internships.
- Brief description of how technology will be transitioned into the company.
- Brief description of milestones or decision points for the distribution of support.

DO:
- Request the industry letter early as companies often have multiple approval levels
- Make sure LOS in-kind matches the amount listed in Section B.1.
- Identify a project point of contact in case of questions

DON'T:
- Wait until the last minute to ask for a letter of support
- Submit generic letters "we will support the JCATI project"

VI. Biosketch (2-page limit each for PI/Co-PI)

- Create an abbreviated biosketch with information that may be pulled from your NSF biosketch. Maximum 2 pages each for PI/Co-PI. Include only the following sections:

  - Professional preparation: undergraduate and graduate education, postdoctoral training
  - Appointments: in reverse chronological order list academic or professional for the last 10 years
  - Products: up to 5 products related to expertise required for the JCATI project. Products can include publications, patents, data sets, software, startups, etc.

VII. Budget and Justification

- Work with your department grants team on your JCATI budget. Use the budget form found under Application Forms on the [JCATI funding page](). Include a budget justification briefly describing charges under each heading. The budget form must be signed off by both the PI and fiscal staff.
- JCATI funded projects do not allow Facilities and Administrative costs (indirects/overhead).
- Each project has only one PI and one budget number. Student and postdoc FTE cannot be split between JCATI funded projects.
- Carry forward is not allowed with JCATI projects. Budget deficits must be resolved by the end of the project period. Any unspent award funds are returned to the state.

- Neither of the optional items (USP or JCDREAM) are line items in the budget. They are separate from the basic project and these funds will be added to the requested project budget.

- A. Senior personnel:
  - Faculty salary can draw from only one JCATI project. If a funded PI has FTE on a different JCATI funded project, the PI must pick which project to draw salary from.
  - Tenure track faculty are limited to one month summer salary. Research faculty may request more than one month salary.
- B. Other Personnel:
  - Graduate students listed on JCATI projects receive tuition waivers except for UW Mechanical Engineering Master's students taking PCE courses. PCE will not waive tuition for students on JCATI projects. If one of your UW ME students is in this program, you must budget for their tuition costs.
- D. Equipment:
  - Include a quote for any equipment over $5000
  - JCATI funds cannot be used for foreign transactions.
  - All project purchases must follow the procurement rules set by their institution.
- E. Travel:
  - JCATI funds are only for US travel. Foreign travel is not allowed.
  - The format of the 2023 symposium is still unclear. The PI should include $750 for their own potential symposium travel and lodging. JCATI pays for student symposium travel/lodging costs.
  - Funds are intended for travel to industry partner facilities for meetings, onsite testing, etc.

DO:
- Make sure total tenure track faculty FTE doesn't exceed 1.0 month
- Include an equipment price quote and description in the justification
- Describe in the narrative why the requested equipment is necessary for project success
- Include brief details for each category in the Budget Justification
- Make sure the budget is signed off

DON'T:
- Pad your budget with excessive travel or supplies funds
- Plan on using JCATI funds for foreign travel
- Skip budget approval process
- Wait until the last minute to ask for budget help

Submitting your proposal

DO:
- Look over the Online Application Form on the RFP website in advance
- Complete the proposal cover sheet with appropriate signatures
- Assemble sections in order into one PDF for upload. Do you have the correct version? Done a final proofreading?
- Are you under the file size limit?
- Determine who submits the proposal: you? Grant manager? Student?
- Use the RFP checklist to make sure you haven't forgotten anything

DON'T:
- Wait until the last minute. Proposals are time stamped upon receipt in the system, not when you send them! There is always a lag.
- Email your proposal to the Program Manager. Only proposals submitted via the JCATI website are reviewed
- Ask the Program Manager if everything looks ok. We don't provide proposal input or notify applicants of missing sections.
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NOTE: The JCATI website creates an automated email acknowledging proposal submission. Additionally the Program Manager notifies every PI as the database receives and time stamps the application.

Proposal Review Process

- JCATI proposal reviewers sign confidentiality agreements to ensure proprietary proposal information is undisclosed.
- The JCATI Board of Directors discuss reviewer scores and comments as a part of the final project selection.
- Proprietary information is kept confidential. When award selections are announced and JCATI funds committed, project name, PI and industry partners are listed on the JCATI website. Information from unfunded applications is not made public unless authorized.

Award Terms and Conditions

- Award decisions cannot be appealed. No award is final until a grant agreement has been executed. The applicant's academic institution is legally responsible for authorizing and submitting proposals, administering the grant, and disbursing JCATI funding.
- If the award differs from the amount requested, a revised budget and project scope must be submitted to the JCATI Program Manager and approved before funds are awarded.
- The PI is responsible for leading the proposed work, managing the budget, attending the symposium along with their students and reporting progress. The industry partner is responsible for delivering in-kind support and transitioning the technology into the company.
- PI must get approval from JCATI Program Manager to spend their award funds other than as outlined in their budget/budget justification.
- JCATI funds cannot be transferred outside WA or to a private institution if the PI changes academic institutions.
- JCATI requires a final report including information on technology transition progress and student involvement. Any unspent research funds are returned to the state. JCATI will continue to follow up with the PI for updates on the industry transition and external funding
- Recipient organizations, principal investigators and industry partners are expected to reasonably assist JCATI in communicating funded work and its impact on the WA aerospace industry. JCATI program funding depends on continued WA legislative support so it is vital to update state officials on JCATI's importance to WA aerospace.