INFUSE | Innovation Network for Fusion Energy

DOE SC FES Private/Public Partnership Program

URL: https://infuse.ornl.gov
Email: infuse@ornl.gov

# INFUSE FY2025 Workshop

A. Lumsdaine & E. Gilson

INFUSE Program Updates
November 14, 2024

INFUSE Overview

The mission of INFUSE is to provide private-sector fusion companies access to the expertise and facilities of DOE's national laboratories and (since FY2022) U.S. academic institutions to overcome critical scientific and technological hurdles in pursuing development of fusion energy.
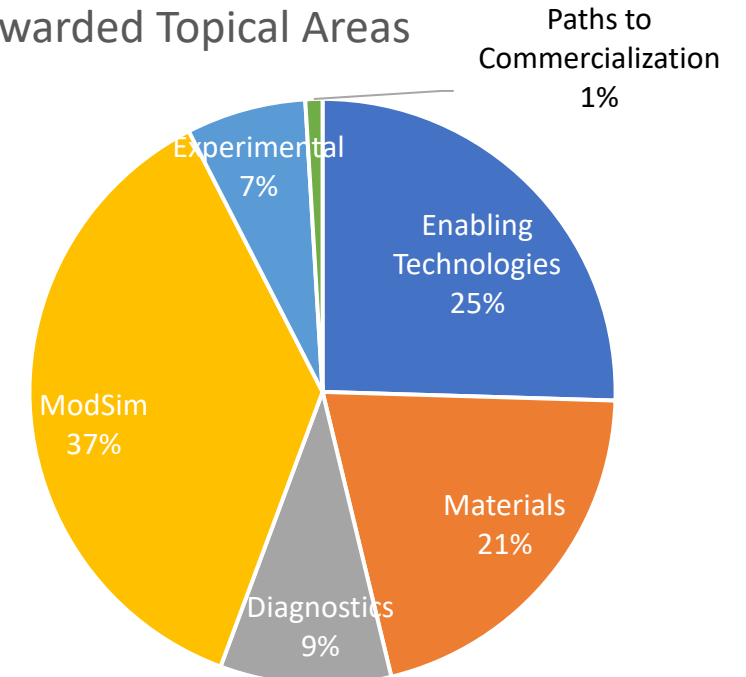
AWARDS

- **106** projects funded since 2019 with a total value of **$23.4M**
- Awards were made to **32** private companies partnering with **10** DOE labs and **12** U.S. Universities.
- Detailed list: https://infuse.ornl.gov/awards-and-statistics/
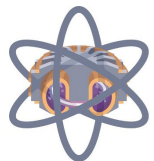
PARTICIPATING LABORATORIES

Awarded Topical Areas

- Paths to Commercialization 1%
- Experimental 7%
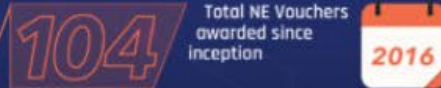- Enabling Technologies 25%
- ModSim 37%
- Diagnostics 9%
- Materials 21%

TOPICAL AREAS

1) Enabling Technologies
2) Materials Science
3) Plasma Diagnostics
4) Modeling and Simulation
5) Unique Fusion Experimental Capabilities
6) Paths to Commercialization

The U.S. Department of Energy's Office of Nuclear Energy established the GAIN initiative to provide the nuclear community with access to the technical, regulatory, and financial support necessary to move innovative technologies toward commercialization.
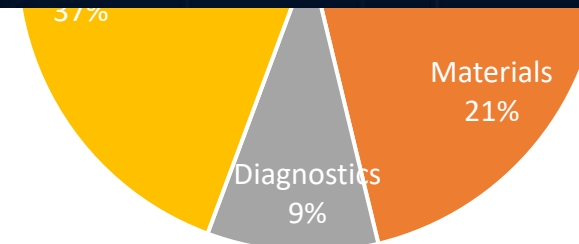
The NE Voucher Program is one way to provide industry with access to the unique research capabilities and expertise at DOE's national labs.

NE Vouchers By the Numbers

9.0 — Years nuclear energy vouchers have been awarded through GAIN

64 — Different companies awarded vouchers to date

104 — Total NE Vouchers awarded since inception — 2016

64 — Total NE Vouchers completed

4 — NE Voucher funding cycles now offered each year

$37.2M — Amount of voucher funding awarded through GAIN since FY16

$500K — Typical maximum size of an NE Voucher
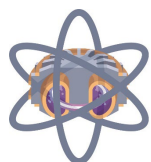
12 Months — Maximum length of project

GAIN

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PARTICIPATING LABORATORIES

INL — Idaho National Laboratory

BROOKHAVEN NATIONAL LABORATORY

BERKELEY LAB — Lawrence Berkeley National Laboratory

LAWRENCE LIVERMORE NATIONAL LABORATORY

OAK RIDGE National Laboratory

Pacific Northwest NATIONAL LABORATORY

PPPL — PRINCETON PLASMA PHYSICS LABORATORY

Sandia National Laboratories

Savannah River National Laboratory

Los Alamos NATIONAL LABORATORY — EST. 1943
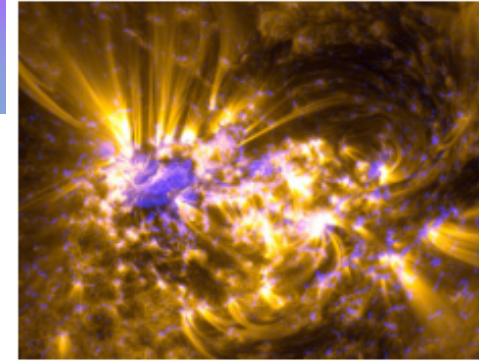
Fermilab

37%

Materials 21%

Diagnostics 9%

TOPICAL AREAS

1) Enabling Technologies
2) Materials Science
3) Plasma Diagnostics
4) Modeling and Simulation
5) Unique Fusion Experimental Capabilities
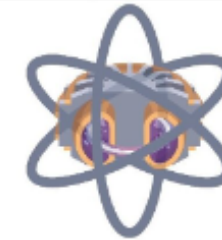6) Paths to Commercialization

INFUSE Web Site

https://infuse.ornl.gov/

Any issues?
Email infuse@ornl.gov

INFUSE Web Site – Subscribe

The INFUSE program will accelerate fusion energy development in the private sector by reducing impediments to collaboration involving the expertise and unique resources available at DOE laboratories and universities. This will ensure the nation's energy, environmental and security needs by resolving technical, cost, and safety issues for industry.

Read more

INFUSE News

FY2025 RFA Call Has Been Posted
Published: November 8, 2024

Read article

DOE Job Opportunity – Program Manager for QIS and Emergent Confinement Concepts
Published: October 9, 2024

View article on content.govdelivery.com

FY2025 Virtual Workshop on Nov. 14, 2024. Draft Agenda Posted.
Published: October 1, 2024
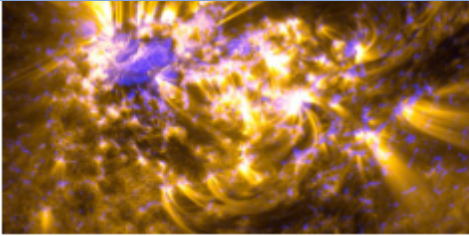
View article on infuse.ornl.gov

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http://eepurl.com/iBeZiM

INFUSE Innovation Network for Fusion Energy

Enter information below to be informed of INFUSE program funding calls and other news. You will be able to unsubscribe at any time.

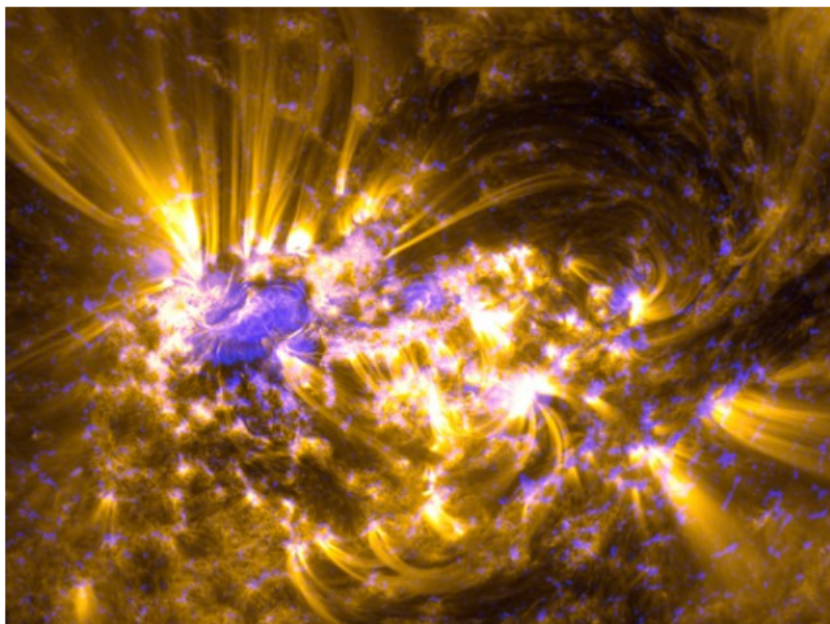**Email Address**

First Name

Last Name

Subscribe

INTUIT mailchimp

Emails will come from infusenews@mailer.ornl.gov

INFUSE Web Site – Meetings

INFUSE Web Site – Submission

- **RFA Submission Access** – Need to start here if submitting an application
- **RFA Submission Information** – RFA call, documents and templates
- **Frequently Asked Questions** – take a look! It has been updated and reorganized. It will continue to be updated as questions come up.

INFUSE Web Site – Library

- The Library has been organized better into coherent informational areas.
- This includes National Lab Capabilities and University Contacts.
- If a University faculty member would like to be added to this directory, there is a link at the bottom of the contacts page.

INFUSE Schedule

❑ FY2025

  ➢ Nov. 8, 2024   RFA posted

  ➢ Nov. 14, 2024   Virtual workshop

  ➢ Nov. 14, 2024   RFA submission opened

  ➢ **Jan. 17, 2025**   **RFA submissions closed (5:00pm EST)**

  ➢ June 2025   Award Announcement Expected

  ➢ Sep. 1, 2025   Work Start Date

INFUSE Process

Preparation Phase
- Identify priority R&D
- Identify partner institution
- Agree upon work scope (Record of Discussion)

Application Phase
- Technical narrative
- Budget and cost-share
- Supporting Documents
- Lab Only: CRADA certification (does not need to be executed for application)
- University Only: Establish Intellectual Property Management Plan (IPMP) and IPMP certification

Award Phase
- Award notification
- Lab Only: Lab submits Field Work Proposal (FWP) and receives funding
- Lab Only: Establish standardized CRADA
- University Only: University submits proposal to SC Open Notice
- University Only: DOE awards funding via grant/cooperative agreement
- Begin work

Private Industry

RFA submission

IPMP

CRADA

DOE-INFUSE

Grant/Cooperative Agreement

M&O Contract/FWP

U.S. Universities

DOE Laboratories

What is Changing for FY2025?

1. Eligibility – company must have SAM.gov Unique Identity ID

2. IPMP grace two-week grace period

3. Lab PI effort must be 15% of scope (reduced from 25%)

4. Four application maximum per company (down from five)

5. Appendix 1 – One 3-page PIER plan, primarily lab / university

6. Appendix 4 – foreign affiliation information

7. Application organization
   — Can include 3 resumes, limited to 2 pages, at end of Technical Narrative
   — Four possible Appendices (only one mandatory)
   — Resumes and Appendices do not count towards 10-page limit

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Eligibility Requirements

- **Eligible Applicants:** Private companies incorporated in the United States (can be a foreign owned subsidiary – PI and all cost-share must come from US subsidiary). Must have SAM.gov Unique Identity ID at time of submission.

- **Eligible Partner Institutions:** Any DOE national laboratory or institution of higher education with unique capability that is not available in the private sector. Partners must agree to work (record of discussion).

- **Award size:** $100K to $500k with a 20% cost share requirement, 12 months in duration. Requests of higher amounts and up to 24 months will be considered for work deemed to be of critical value to the company.

- **Number of Allowable Applications:** 4 per company per RFA call.

- **Company Certifications:** (1) Cost-share certification; (2) IP Certification (CRADA or IP Management Plan); (3) Conflict of Interest certification ("button push" on submission site).
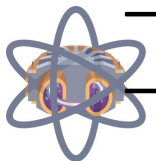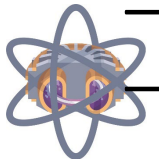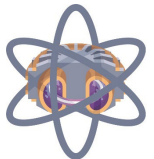
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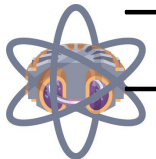   — Resumes and Appendices do not count towards 10-page limit

IPMP Two Week Grace Period

- **Intellectual Property Management Plan (IPMP)**
  — The IPMP is required as a part of the submission package for university partners.
  — This is an agreement between the company and the institute of higher education.
  — INFUSE has no template for the plan or requirement on its format.

- **The IPMP must be submitted as a part of the application**
  — A two-week grace period will be allowed (to 1/31/2025).

- **The INFUSE "Library" page has a University Contacts Directory**
  — https://infuse.ornl.gov/infuse-contacts/
  — This will be updated as we continue to identify possible partners for relevant work.
  — The University Fusion Association could be a resource in identifying universities that have faculty performing research in this area: https://sites.google.com/site/universityfusionassociation/home
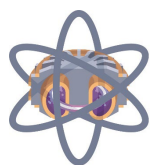
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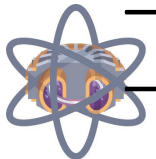   — Resumes and Appendices do not count towards 10-page limit

Submission Requirements Changes

- **Lab PI effort must be 15% of scope (reduced from 25%)**

  — Increase in award ceiling to $500k has made the required 25% PI effort challenging.
  — Although this requirement is reduced, it must still be clear that the PI is substantially involved in the project.

- **Four application maximum per company (down from five)**

- **Application organization**

  — Can include 3 resumes, limited to 2 pages, at end of Technical Narrative.
  — These should be submitted as a part of the Technical Narrative PDF
  — Four possible Appendices (only one mandatory).
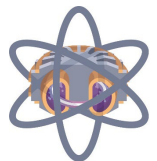 — Resumes and Appendices do not count towards 10-page limit.

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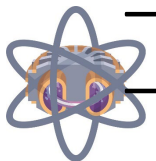   — Resumes and Appendices do not count towards 10-page limit

Appendices

1. **Promoting Inclusive and Equitable Research (PIER) Plan - REQUIRED**

2. **Images and tables (if necessary)**
    — Maximum of 2 pages.

3. **Project distinction from other DOE support**
    — Applicants with ongoing DOE funded projects may include information to explain how the proposed INFUSE project is distinct from other ongoing funded awards.
    — Maximum 1 page.

4. **US presence**
    — Companies with a foreign affiliation should describe the nature of the U.S. presence, including approximate number and type of employees (engineers, technicians, etc.), the location of lab or office space in the U.S. and the nature of the work undertaken there (e.g., research, development, design).
    — The role of the PI in the U.S. company should also be indicated.
    — Maximum 1 page.
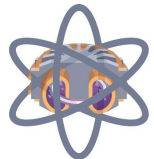
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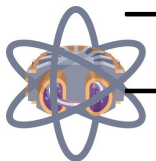
PIER Plan Update

- **Review of PIER Plan**
  - Appendix 1 of the application, 3 page max (not within 10 page limit).
 - Go to https://science.osti.gov/grants/Applicant-and-Awardee-Resources/PIER-Plans/Information-about-PIER-Plans for more information.

- **Notes on the PIER Plan evaluation (change from FY2023 and FY2024)**
  - Because the work will take place at the partner institution (lab or university), the PIER plan should describe activities at the lab or university.
  - However, the PIER plan should also include a short section on proposed engagement or interaction with the company partner which may include joint activities that involve both the company and the partner institution.
  - New merit review question:
    - ➢ Does the proposed PIER Plan include any activity that involves both the company and the partner (lab or university)?
  - It is acceptable to include items in the budget that will support the activities detailed in the PIER plan in keeping with the cost principles in 2 CFR 200.
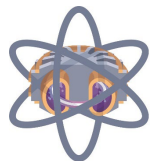
FY 2023 Submission Tips

A few tips on proposal submission:

- You will need to go through the vetting process to get access to the submission site (see following slides). This process can take several days and so should be started as soon as possible.

- Make sure to give sufficient detail outlining the cost share split between private / national lab partners.

- Also see "Tips on writing a successful proposal" document under "RFA Submission Information and Templates" on submission page (http://infuse.ornl.gov/wp-content/uploads/2020/02/INFUSEhints.pdf) or the "Frequently Asked Questions" page under the "Submission" tab.
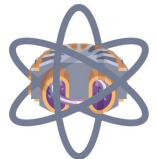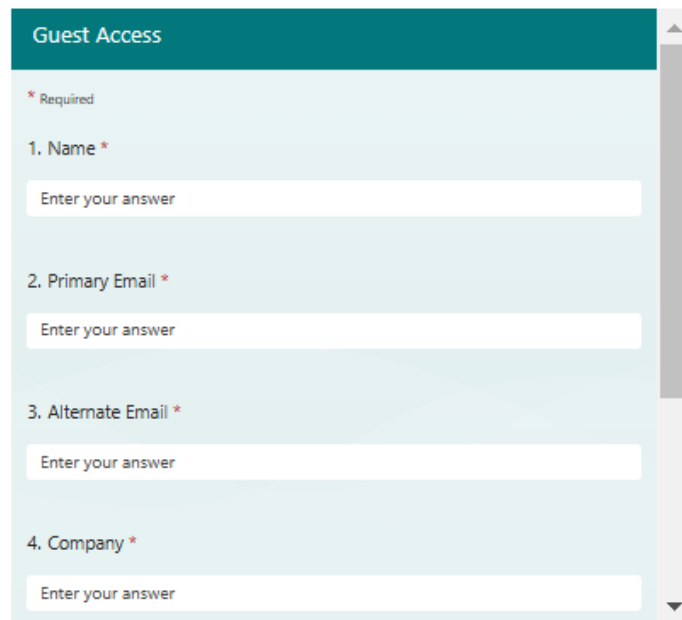
RFA Submission Access

All RFAs must be submitted electronically before the published deadline by the company and submitted as a package on the INFUSE SharePoint site. All submissions are timestamped and certified by the submitters AZURE account to be complete and accurate. E-mailed RFAs are not accepted.

Access to Submission Site (Open)

ORNL has a security procedure for guest access. If you are planning on submitting an RFA, please fill in your information below. You will be contacted with further instructions. Even if you have a vetted account and password from a previous cycle, you will still need to fill out this form to gain access to the submission site for this round. (NOTE: If you have been vetted before and you enter a different email below, then you will need to be vetted again). Anyone needing access to the site should complete this form, whether a company Point of Contact or company Principal Investigator. Once your receive confirmation, you may log into the protected SharePoint site here to begin your submission.

Guest Access

* Required

1. Name *

Enter your answer

2. Primary Email *

Enter your answer

3. Alternate Email *

Enter your answer

4. Company *

Enter your answer

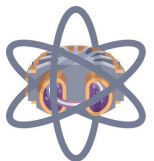https://infuse.ornl.gov/rfa-announcement-and-submission/

- You may begin the process now.
- This is the first step of the "vetting" process to gain access to the RFA application site.

INFUSE questions: infuse@ornl.gov
Arnie: lumsdainea@ornl.gov
Erik: egilson@pppl.gov

Submission – Vetting Process for Guest Access

To request guest access for submitting an RFA Application, please visit https://infuse.ornl.gov/rfa-announcement-and-submission/ and fill out the form under "Access to Submission Site" at the bottom of the page.

An automated process will check if you have already been vetted and your email is in our system.

If you have been vetted in the last 6 months, you will receive an invitation to the RFA Application site along with log in instructions. ***Note that if you have changed software (i.e. reinstalled Authenticator) or hardware (i.e. new cell phone) you will need to email*** infuse@ornl.gov ***in order to reset your MFA.***

If you have not been vetted in the last 6 months, you will receive the email below:

Greetings,

Please use this link to schedule a time when you are available to be vetted for guest access to ORNL's SharePoint sites.

You will need the following:
1. Access to a web camera
2. Driver's license or Passport
*3. A system with Google Chrome (for the Teams web version) or the Teams client installed.*

The link will take you to a bookings page https://outlook.office365.com/owa/calendar/ExternalGuestScheduling@ornl.onmicrosoft.com/bookings/ which will allow you to select the date/time when you can join a Teams meeting.

When the external user selects the date/time they can meet, a Teams meeting gets created for both them and with one of our team members.

At the Teams meeting, both you and our team member will turn on their cameras. You will verify your identity by showing our team member your driver's license or passport. No information or images are recorded.

They will also walk you through any additional steps that may be needed.

Once you have been vetted, you will receive an email invitation to the RFA Application site along with log in instructions.
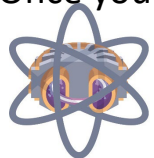
Submission Notes

A few notes on proposal submission:

- You may make any changes to your application while it is in "Draft".

- When you change to "Submit" and press save:
  - You will be notified if any required fields are not completed.
  - You will be sent a confirmation email including a PDF or your submission.

- You can continue to modify your application until Jan. 17 at 5:00pm (EST)

- The system times out after 30 minutes!

You may submit once required fields are completed. *

⦿ Draft   ○ Submit

Important! Submitted applications can continue to be modified until the application close date. No applications are reviewed until that time. After submitting, you will receive a PDF copy of the form for additional review (allow 5 minutes).
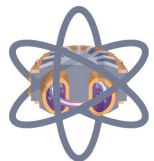
Last saved 02/23/2023 9:01 AM

Save   Cancel

# INFUSE will be asking for <u>brief</u> quarterly reports

We will be asking for quarterly updates from both company and partner PI's.

- One-page forms will request the following:
  - o Status of CRADA
  - o Progress towards project goals
  - o Any issues or concerns?
  - o Is cost share (company) and budget/schedule (partner) on track?
- These are expected to be "short answer".
- We will start with FY2024 awardees.
- Due dates in 2025 – January 31, April 30, July 31, October 31.
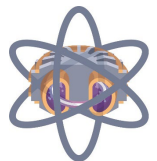
What We Need From You

- In order to communicate INFUSE success stories to stakeholders we are needing **final reports** and **project summary slides**. The slides should:

  ➢ Describe technical impact

  - Artifacts generated (papers, patents, etc.)
  - Technical readiness demonstrated / matured
  - Risks mitigated

  ➢ Describe business impact

  - Progress towards company objectives
  - Input into other funding opportunities
  - Risks mitigated
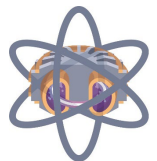
Divertor Component Testing

| Partner	Company
Oak Ridge National Laboratory	Commonwealth Fusion Systems
Dr. Travis Gray	Dr. Adam Kuang Dr. Matthew Reinke

Project Summary:
Execute high heat flux testing of the base material being considered for SPARC at representative loads.

Fusion Impact:
Qualified the use of tungsten heavy alloy (WHA) - 97% W, 2% Ni, 1% Fe by weight, for use in tokamaks under higher heat fluxes than previously assessed and documented failure mechanisms relative to pure tungsten.

Business/Market Impact:
Potential cost savings to future devices as tungsten heavy alloy has significantly lower machining cost relative to pure tungsten. Material properties also enable larger components, thus reducing part count.
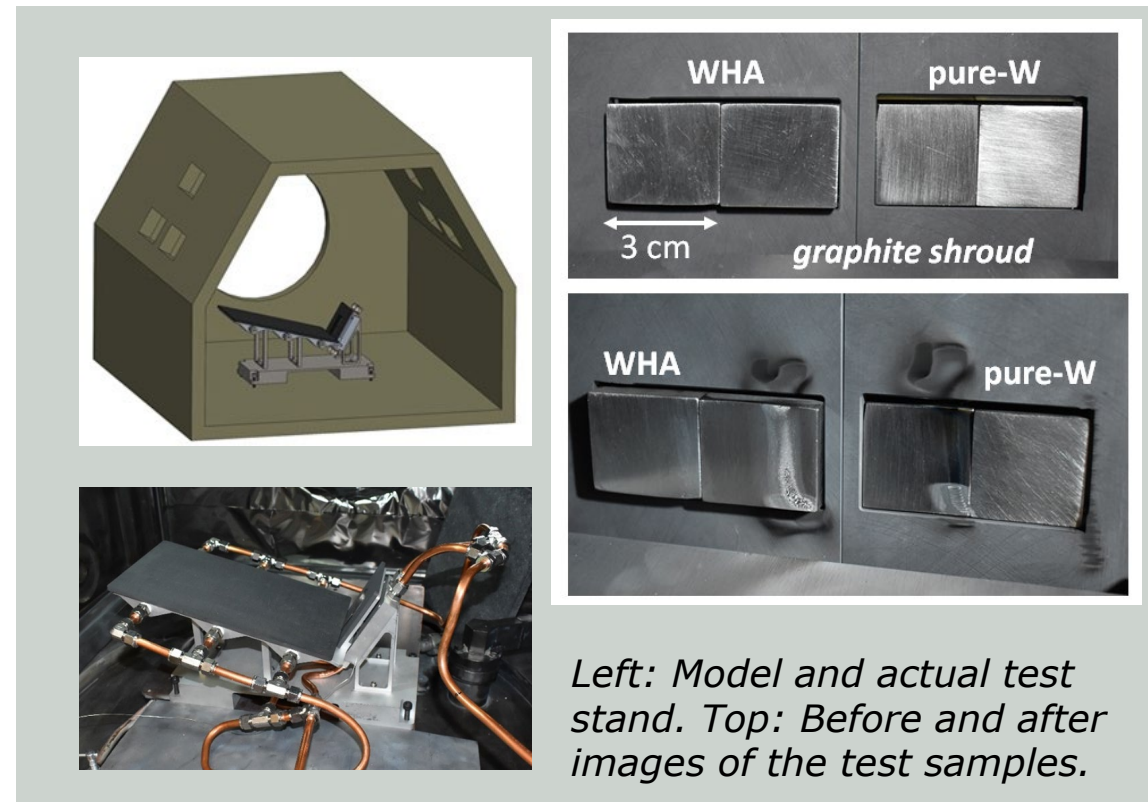
Left: Model and actual test stand. Top: Before and after images of the test samples.

Period of Performance:
3/2020 - 3/2021

Questions?