

URL: <https://infuse.ornl.gov>  
Email: [infuse@ornl.gov](mailto:infuse@ornl.gov)

# Welcome

**Welcome to Industry**  
**What is INFUSE and how is it organized?**  
**Changes in 2020**  
**Intro to POCs & Lab Capabilities**  
**MiniWorkshops, working groups, & resource library**



# Introductions



**Dennis Youchison-ORNL,  
INFUSE Director**

MS-6304, P.O. Box 2008  
Oak Ridge, TN 37831  
Phone (865) 574-0208  
Fax (865) 576-7926  
[youchisondl@ornl.gov](mailto:youchisondl@ornl.gov)



**Ahmed Diallo PPPL,  
INFUSE Deputy Director**

MS-34, P.O. Box 451  
Princeton, NJ 08543  
Phone: (609) 243-2560  
Fax: (609) 243-26665  
[adiallo@pppl.gov](mailto:adiallo@pppl.gov)



*Innovation Network for  
Fusion Energy*

Ahmed Diallo is the leader of the pedestal structure and control topical science group of the National Spherical Torus Experiment-Upgrade (NSTX-U) and is a recipient of a DOE Early Career award. Ahmed plasma career started when he did an undergraduate research experience at PPPL working on the design of NCSX. He then contributed in the building of a linear device as part of his PhD thesis at the University of Iowa to probe the Case- van Kampen modes (e.g., plasma degree of freedom). During this work, Ahmed developed an expertise in laser aided plasma diagnostics. During his post-doctoral work, Ahmed's research activities spanned wave excitations at the Swiss Federal Technical Institute (EPFL) as well as polarization spectroscopy at the Australian National University (ANU). In 2009, Ahmed returned to the US to begin pedestal physics research at NSTX as well as co-lead the Thomson scattering team. Since then, Ahmed has been involved in most of the fusion research both in US and abroad. Ahmed's background spanned low to high temperature plasma.



For the latest information visit the INFUSE website at:  
<https://infuse.ornl.gov>

Please send your feedback to

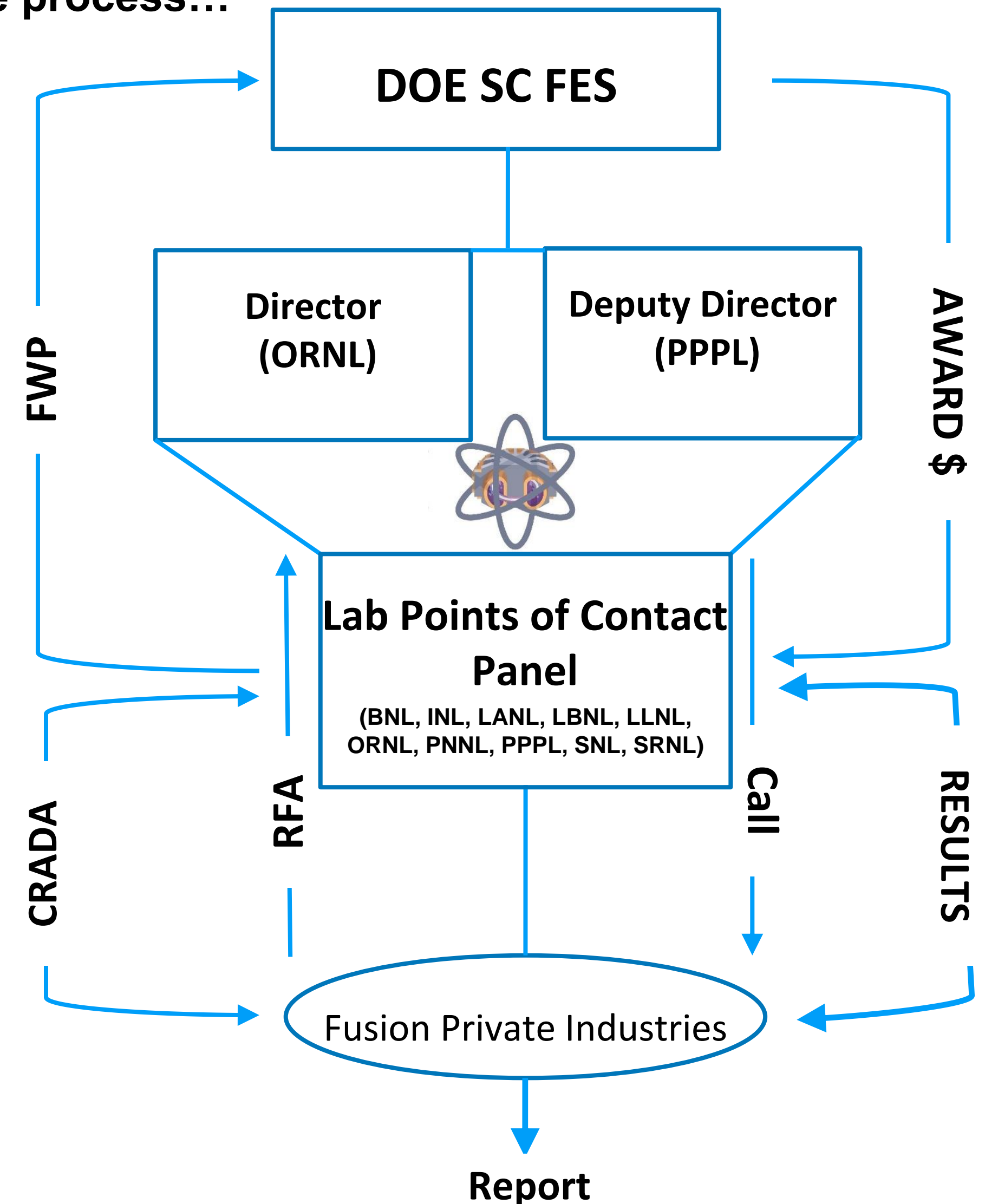




# What is INFUSE?

INFUSE is a private/public partnership to accelerate innovation in fusion research in the private sector by lowering barriers to collaboration between industry and US DOE national laboratories. The DOE awards funding directly to laboratories in response to a Request for Assistance (RFA) application from a US private company. The RFAs are collected and reviewed after a call period and passed to FES for award selection. Projects must involve scientific research and cannot compete with any private sector services.

The process...



# Changes to POCs

- **2 labs added to original 8. INFUSE now has 10 participating laboratories.**

We welcome Sandia National Laboratories – **Rob Kolasinski** – hydrogen & tritium PSI and permeation

Savannah River National Laboratory – **Dave Babineau** – tritium & fuel cycle

- **2 retirees replaced**

- We give our sincere thanks to **Tom Rognlien** at LLNL and **Rick Kurtz** at PNNL for their assistance with the pilot program.
- We welcome **Wahyu Setyawan** at PNNL as the new INFUSE POC
- We welcome **Andris Dimits** at LLNL as the new INFUSE POC

# 2020 Program changes

*\*The following is subject to final approval from DOE FES*

- **Eligibility:** In 2020 US companies with a majority foreign ownership can now participate  
All must show economic advantage to US economy, must accept CRADA terms and export control restrictions
- **Two labs added to INFUSE program:** SNL and SRNL for expertise in tritium and fuel cycle.
- **Max. number of proposals per company is 5, but no longer restricted to one from each topical area.**
- **Maximum award values likely to increase pending final budget breakdown**
- **Two RFA calls anticipated. One in ~January, the second in ~June. Dates yet to be finalized**
- **Six-month window established to execute CRADAs or award is rescinded.**
- **Annual workshop added. Venue will move to attract largest industry participation. Include a previous projects poster session.**
- **More detailed lab capabilities posted to web site**

# 2020 Program changes

- Formulation of “working groups” and begin discussion of mini-workshops/webinars
- Record-of-Discussion documentation required with RFA submission
- A DUNS number and US registration still required
- Pay attention to abstract. It will be public.
  - **Suggestions for abstract preparation on web.**
- 2021 2-day Workshop will include poster session featuring 2019 projects
- Final CRADA report can serve as INFUSE report  
(ensure all IP and EC are removed, due at end of CRADA)
- Questions?

# ARPA-e Perspectives

- **Welcome Scott Hsu**

**DOE ARPA-e Program Director**



# HPC Access...2021



- **INFUSE has begun dialog with OLCF and NERSC to apply for allocations**
- **CPUs: NERSC @ LBNL**
- **GPUs: OLCF @ ORNL, M&IC @ LLNL**
- **Consider adding allocation request form to submission site; so request can be routed as proposals are reviewed.**





# University participation

- **University participation is welcome**
  - Subcontract directly from company
  - Subcontract from laboratory
  - Use existing laboratory student program(s)  
(fit or overlap with project duration)
- **Workforce development for industry**

# Break



# Lab Capabilities

The following will be a series of presentations describing fusion research capabilities at each laboratory by the lab's POC.

## Things to note:

- Can only use existing facilities. New code and theory development encouraged.
- Universities and students can participate through the laboratory or through the company.
- Legal obligations are through the lab and the company as outlined in the CRADA which addresses IP and EC. Each Lab's CRADA (SPP) Office handles negotiations.
- CRADA SOW should match INFUSE proposal SOW
- CRADA funding must agree with submitted and approved FWP
- Cost estimates and Labor detail outlined in CRADA
- CRADA must be approved by DOE site office and executed by both lab and company.
- Six months to execute CRADA from award notification date.

# Official Points-of-Contact

Brookhaven National Laboratory (BNL)	Ramesh Gupta	<a href="mailto:gupta@bnl.gov">gupta@bnl.gov</a>	(631) 344-4805
Idaho National Laboratory (INL)	Brad Merrill	<a href="mailto:brad.merrill@inl.gov">brad.merrill@inl.gov</a>	(208) 526-0395
Lawrence Berkeley National Laboratory (LBNL)	Steve Gourlay	<a href="mailto:sagourlay@lbl.gov">sagourlay@lbl.gov</a>	(510) 486-7156
Lawrence Livermore National Laboratory (LLNL)	Andris Dimits	<a href="mailto:dimits1@llnl.gov">dimits1@llnl.gov</a>	(925) 422-9830
Los Alamos National Laboratory (LANL)	Glen Wurden	<a href="mailto:wurden@lanl.gov">wurden@lanl.gov</a>	(505) 667-5633
Oak Ridge National Laboratory (ORNL)	Dennis Youchison	<a href="mailto:youchisondl@ornl.gov">youchisondl@ornl.gov</a>	(865) 574-0208
Pacific Northwest National Laboratory (PNNL)	Wahyu Setyawan	<a href="mailto:wahyu.setyawan@pnnl.gov">wahyu.setyawan@pnnl.gov</a>	(509) 371-7692
Princeton Plasma Physics Laboratory (PPPL)	Ahmed Diallo	<a href="mailto:adiallo@pppl.gov">adiallo@pppl.gov</a>	(609) 243-2560
Sandia National Laboratories (SNL)	Rob Kolasinski	<a href="mailto:rkolasi@sandia.gov">rkolasi@sandia.gov</a>	(925) 294-2872
Savannah River National Laboratory (SRNL)	David Babineau	<a href="mailto:dave.babineau@srnl.doe.gov">dave.babineau@srnl.doe.gov</a>	(803) 507-5428



# Lab Capabilities A

9:00 – 9:15 am	Brookhaven National Lab (BNL)	Ramesh Gupta	All	400A UTK Conf
9:15– 9:30 am	Idaho National Lab (INL)	Brad Merrill	All	400A UTK Conf
9:30 – 9:45 am	Lawrence Berkeley National Lab (LBNL)	Steve Gourlay	All	400A UTK Conf
9:45 – 10:00 am	Lawrence Livermore National Lab (LLNL)	Andris Dimits	All	400A UTK Conf
10:00 – 10:15 am	Los Alamos National Lab (LANL)	Glen Wurden	All	400A UTK Conf (remote)

# Break



# Lab Capabilities B

10:30 – 10:45 am	Oak Ridge National Lab (ORNL)	Dennis Youchison	All	400A UTK Conf
10:45 – 11:00 am	Pacific Northwest National Lab (PNNL)	Gert Patello for Wahyu Setyawan	All	400A UTK Conf
11:00 – 11:15 am	Princeton Plasma Physics Lab (PPPL)	Ahmed Diallo	All	400A UTK Conf
11:15 – 11:30 am	Sandia National Labs (SNL)	Rob Kolasinski	All	400A UTK Conf
11:30 – 11:45 am	Savannah River National Lab (SRNL)	David Babineau	All	400A UTK Conf

# Lunch

# Fusion Industry Association

- **Welcome Andrew Holland**

**Fusion Industry Association**

<https://www.fusionindustryassociation.org>



# Industry Needs & Feedback

A. Diallo (PPPL) & D. Youchison (ORNL)

Mostly collected from emails and feedback form

# Few questions collected by Ryan Umstatt on behalf of the private industries

- ***Can INFUSE provide mechanism to pair labs with industries?***
  - ▶ *Yes - for now, we encourage the industries to contact the lab POCs as well as Dennis and me to facilitate such pairing*
  - ▶ *As the program evolves, we plan to generate such list in a spreadsheet format*
- ***Can INFUSE lab partners be expanded to NNSA and NE labs?***
  - ▶ *All the NNSA labs are already included as well as two of the NE labs. We are still missing Argonne - Work in progress.*
- **Regarding the awards amount - given the senate language there is a possibility that the award amount will increased**

## Few questions collected by Ryan Umstatt on behalf of the private industries

- **Term and conditions: There is no room for negotiations if we want to stream line the CRADA - It is best to keep it standard to avoid case-by case delays in the execution period**
- **We plan to host a public event to publicize the project awarded via workshops -**



# Open Discussion

# Break

# Mini-workshop Discussion

**Is Industry interested in self-organized mini-workshops?**

- **Setup topical area working groups**
- **Working groups consist of interested industry and lab SME's. Led by an INFUSE POC.**
- **Each working group can put together a mini-workshop for industry and gov't experts. (can be meeting or webinar)**
- **Examples: HTSC, molten salts, disruption mitigation, MHD simulations, tritium separation...**