

# INNOVATION WORKFORCE

Tech Partnerships

U.S. DEPARTMENT OF  
**ENERGY**

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*Office of*  
**TECHNOLOGY TRANSITIONS**



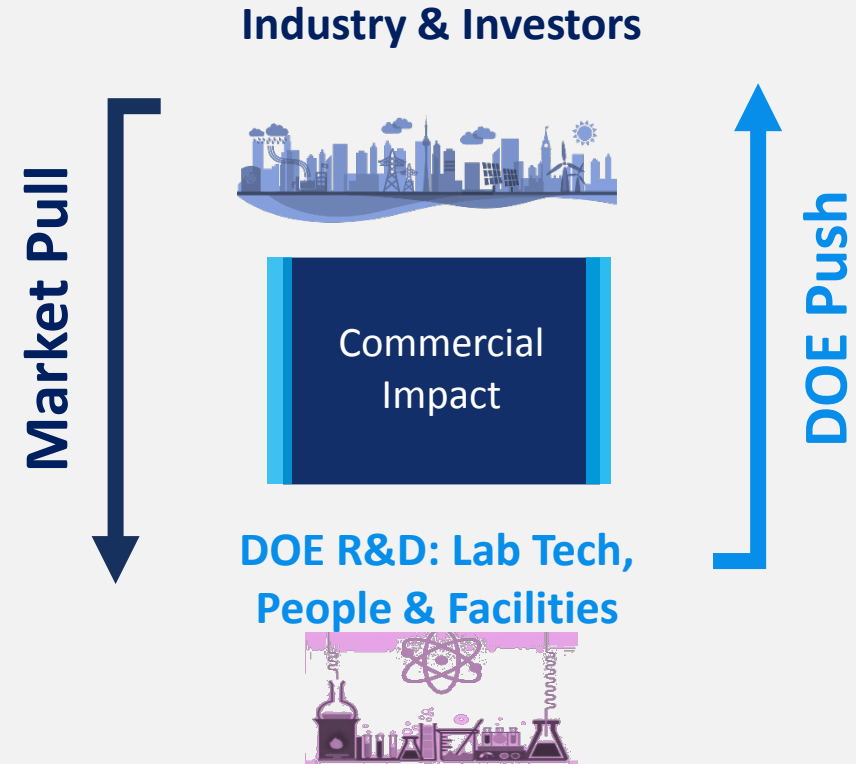
# ABOUT OTT

Webinar goals: Share a sampling of all the opportunities in the OTT Toolkit.  
Build interest in collaboration with DOE.

Overview: The Office of Technology Transitions (OTT) advances U.S. economic, energy, and national security by expanding the commercial impact of the Department of Energy's research and development portfolio.

It fosters partnerships that guide innovations from the lab into the marketplace.

## Forging new connections







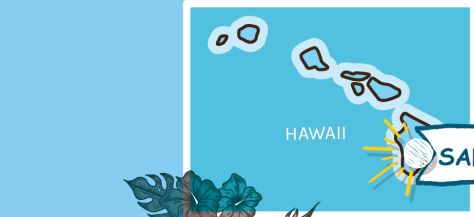
# DEPARTMENT OF ENERGY NATIONAL LABS

# STEM RISING

U.S. DEPARTMENT OF ENERGY



ALASKA



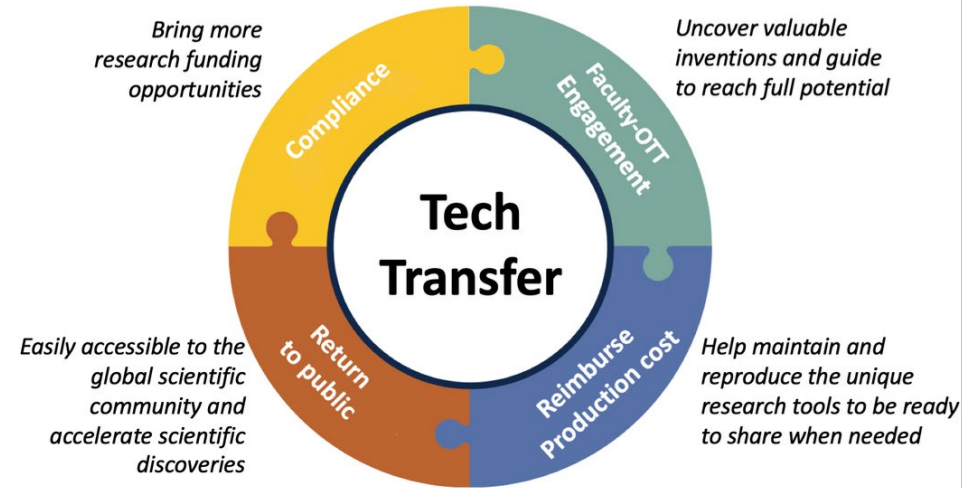
HAWAII



[www.labpartnering.org](http://www.labpartnering.org)

# IN THE FIGHT

Lawrence Livermore National Lab teams up with universities & industry to combat COVID-19 swab shortage



## Technology Advancement

- Hundreds of swabs tested in grassroots effort
- Lab simulation of medical environment for rapid turnover
- Instant feedback and iteration
- Enabled team to meet requirements for COVID-19 testing

## Impact

- FDA exemption earned
- Swabs made available to healthcare providers
- Swab optimization work continues
- Expanding to other 3D-printed components for test kits



# UNIVERSITY TOOLKIT

## Tailored Resources for University Administrators

### Opportunities to engage: Access to resources for:

- Student internship/fellowship opportunities with DOE and the Labs
  - DOE funding programs targeted to the university community
  - Resources for university facility administrators – e.g. Better Buildings
- ✓ Energy-efficient buildings infrastructure
  - ✓ National Laboratory map & links to Laboratory virtual tools
  - ✓ University-focused DOE & Lab funding programs
  - ✓ Fellowships, internships, & trainings
  - ✓ Federal funding awards link
  - ✓ Resources for entrepreneurs & start-ups
  - ✓ Events

<https://www.energy.gov/technology-transitions/downloads/ott-stem-resources>



### University Toolkit & Resource Packet 2019-2020

Office of Technology Transitions (OTT)



U.S. DEPARTMENT OF  
**ENERGY**

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*Office of*  
**TECHNOLOGY TRANSITIONS**

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202-586-2000





# **KC Chamber Workforce Initiative AUTM Webinar**

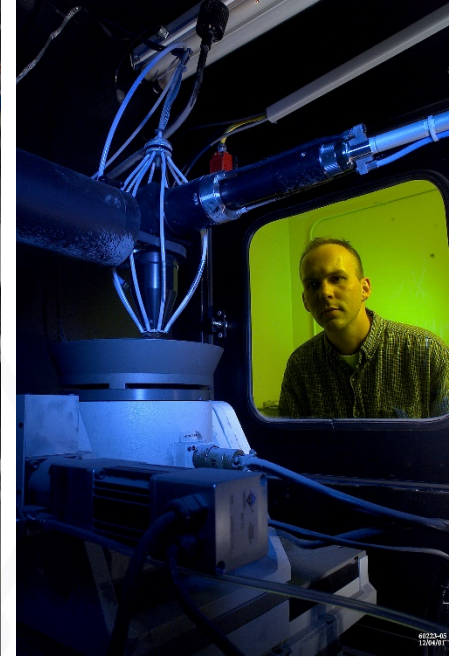
10/14/2020

Jim Jamieson Director – Strategy & transformation  
Kansas City National Security Campus Managed by Honeywell  
[jjamieson@kcncsc.doe.gov](mailto:jjamieson@kcncsc.doe.gov) 816.488.6710



Honeywell manages the DOE's National Nuclear Security Administration's Kansas City National Security Campus.

- Ensures the US nuclear deterrent is safe, secure, reliable
- 70 year history in Kansas City
- Significant workload growth
- Nearly 5,400 employees
- Kansas City, MO – 4 locations
- Overland Park, KS – 1 location
- Albuquerque, NM – 1 Location



Kansas City

Albuquerque

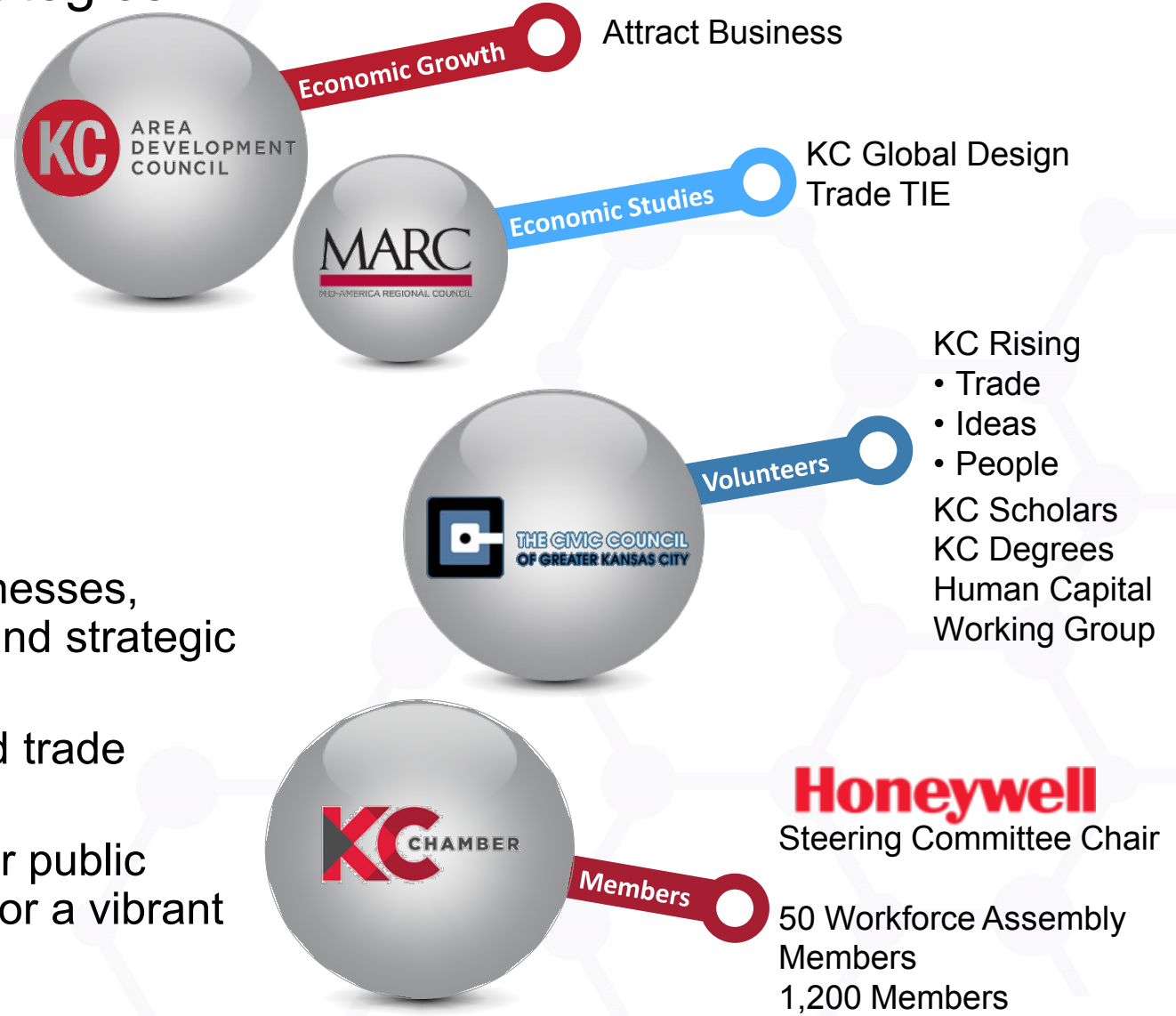
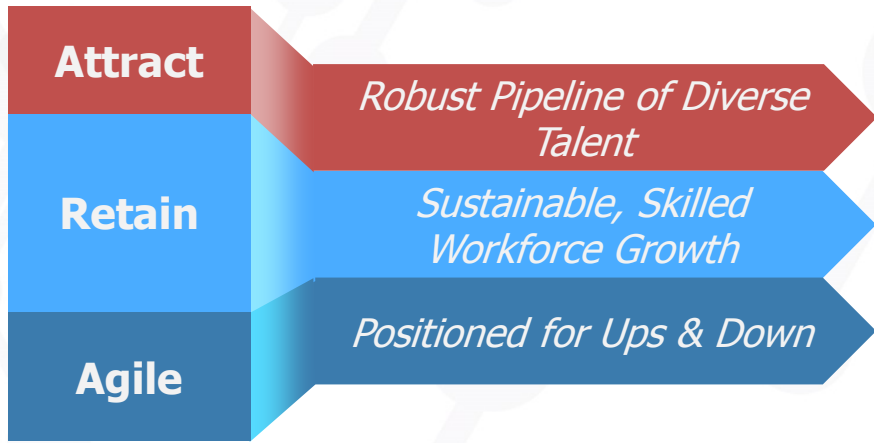


- Major Chamber Investors who designated a portion of their annual investment to workforce development
- Key Community Partners
  - Civic Council's KC Rising
  - Mid America Regional Council
  - Full Employment Council
  - KC Metro Area Superintendents
  - Regional businesses across Health Services, Construction, Manufacturing, Insurance, and others
- Committee Chair: Jim Jamieson, Director – Strategy & Transformation

## Mission:

Guide the Chamber's work to address regional workforce development needs using chamber core competencies and resources.

## Honeywell Workforce Development Strategies

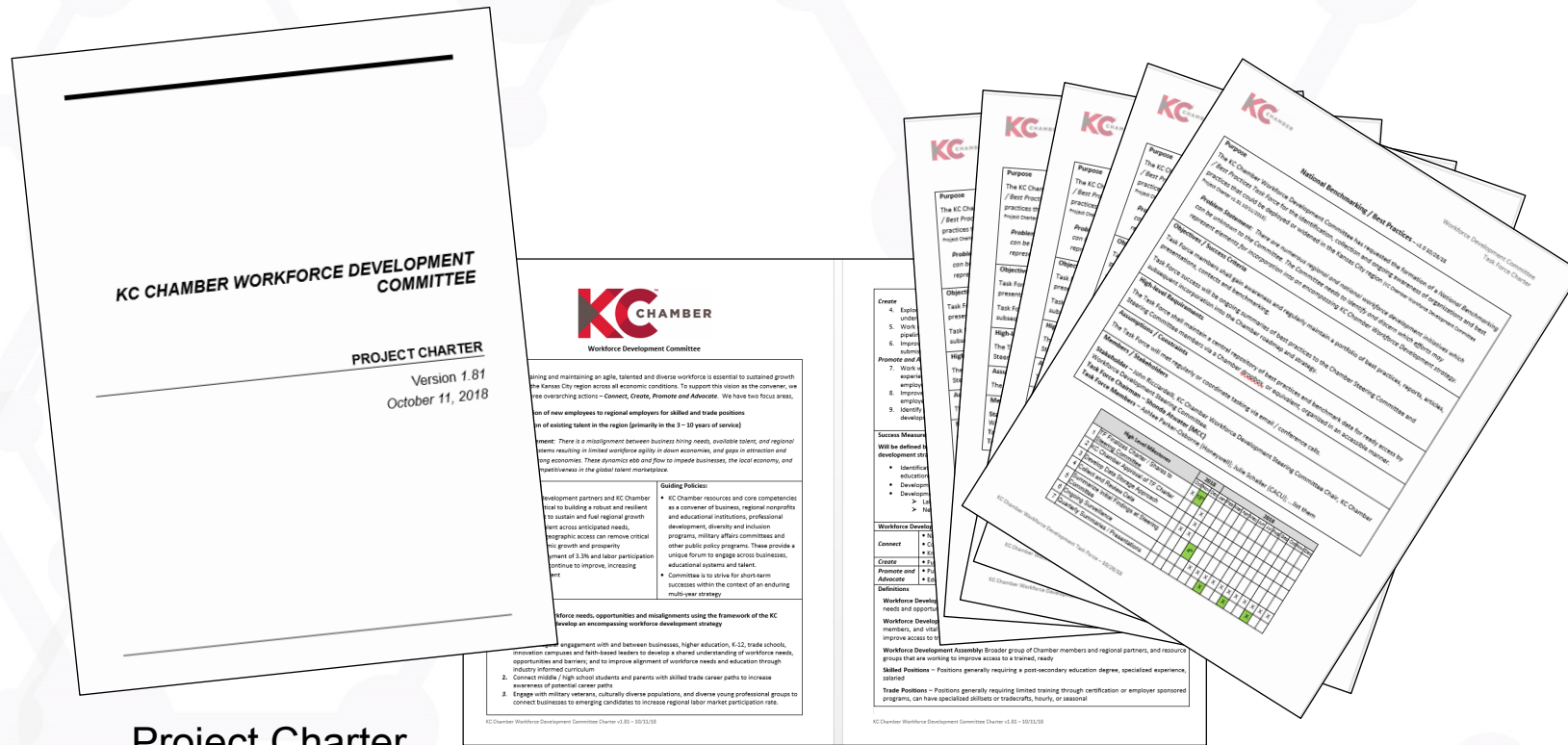


### KC Chamber WF Committee Strategy:

- **Connect:** Convene K-12, post secondary, businesses, community and civic groups for best practices and strategic partnerships
- **Create:** Identify and create awareness of skilled trade opportunities / value proposition / diversity
- **Promote & Advocate:** Identify and advocate for public policy improvement to close gaps and barriers for a vibrant workforce



- **Steering committee led Task Forces - operational**
  - National Benchmarking and Best Practices
  - New, Business to Higher Education - Real World Learning (partnership with Kauffman and KC Rising) / Higher Ed
  - Business to Business
  - Promotion of Skilled Trades
  - Public Policy support to KS and MO workforce related legislation
- **Key Activities**
  - June 2020: Western Pathways Conference in partnership with DeBruce Foundation, rescheduled due to covid
  - May 2020: Real World Learning, 15 school districts lined up to submit proposal for grants from Kauffman Foundation
  - April 2020: KC Chamber DC Fly-in, rescheduled due to covid
  - Nov 2019: RFI for Promotion of Skilled Trades Marketing Campaign, starting grants and fund raising efforts
  - Integration with KC Rising Human Capital, leverage the region to do more
  - Jan 2019: Kansas House Commerce Workforce Committee Testimony
- **Standard KC Chamber WF Steering Committee Operations**
  - Monthly steering committee and quarterly assembly meetings – all market segments and educational elements
  - Ongoing Business to Business TF convening quarterly for exchange of best practices, needs and issues. Over 30 small and medium sized businesses participating
  - Maintain ongoing analysis of regional business workforce needs / regional and national economics
  - Maintain ongoing awareness of local and national best practices



Project Charter

2-page Summary

## Workforce Task Forces

Each led by Steering Committee member


1. National Benchmarking/Best Practices
2. Collaboration of K-12 to Higher Education and Businesses (B2E)
3. Knowledge Sharing Among Businesses (B2B)
4. Public Policy Barriers to Workforce Development
5. Education and Promotion of Skilled Trades

### KC Chamber Strategy

Attracting, retaining and maintaining an agile, talented and diverse workforce is essential to sustained growth and vitality of the Kansas City region across all economic conditions. To support this vision as the convener, we will focus on three overarching actions – **Connect, Create and Promote**. We have two focus areas,

- **Attraction of new employees to regional employers through all postsecondary pathways, with an emphasis on Skilled Trade occupations and those requiring a four year degree**
- **Retention of existing talent in the region (primarily in the 3 – 10 years of service)**

**Problem Statement:** *There is a misalignment between business hiring needs, available talent, perceptions of skilled trades and regional educational systems resulting in limited workforce agility in down economies, and gaps in attraction and retention in strong economies. These dynamics ebb and flow to impede businesses, economic growth, and the region’s competitiveness in the global talent marketplace.*

	Obj. #	Long Range Objectives
<b>Connect</b>	1	Establish regular engagement with and between businesses, higher education, K-12, trade schools, innovation campuses and faith-based leaders to develop a shared understanding of evolving workforce needs, opportunities and barriers; and to improve alignment of workforce needs and education through industry informed curriculum
	2	Connect middle / high school students and parents with skilled trade career paths to increase awareness and perception of potential career paths
	3	Engage with military veterans, criminal justice involved individuals, culturally diverse populations, and diverse young professional groups to connect businesses to emerging candidates to increase regional labor market participation rate
<b>Create</b>	4	Explore opportunities to develop non-traditional recruiting consortium for skilled trades to connect under-served members of the future workforce to hiring needs
	5	Work with partners in the Workforce Assembly to examine the opportunity to establish and market a pipeline of real-world learning opportunities such as registered apprenticeships, internships, certifications, university and community college workforce programs and credentials aligned to regional business needs
	6	Improve access to regional employer hiring through the use of accessible job postings and application submission processes
<b>Promote and Advocate</b>	7	Work with the Workforce Assembly to help streamline connections between employers, real-world learning programs and industry recognized credentials to connect students to potential career paths
	8	Improve alignment of post-secondary programs (certifications, 2 and 4 year programs) with viable career paths and anticipated regional employer hiring needs
	9	Identify gaps, barriers and opportunities in state, federal and local public policy related to workforce development and advocate for policy changes to improve collective outcomes





## KC Chamber Workforce Development – Task Forces

<b>Connect</b>	1	National Benchmarking / Best Practices – Identification, collection and ongoing awareness of Federal Programs, Cities, States and Government initiatives with best practices that could be adopted to the Kansas City region
	2	Collaboration of Business to Education (B2E) – Engagement between educational systems (K-12 and post-secondary programs and degrees) and business to understand needs and gaps
<b>Create</b>		Future Task Force to be defined based on the Connect, Promote and Advocate findings
<b>Promote and Advocate</b>	3	Knowledge Sharing Among Businesses (B2B) – Numerous business led workforce development initiatives are in place or attended, focus is on sharing best practices that can be scaled across Chamber members, build awareness of what is working, leverage lesson learned and enable scale
	4	Public Policy Barriers to Workforce Development – Many ongoing workforce development efforts have identified public policy barriers that need visibility to policy or legislative groups
	5	Education and Promotion of Skilled Trades – Results from the MARC Trade TIE have identified a lack of awareness of skilled trade paths that warrant improvements in the communication of possible career paths and educational / training requirements

# KC Chamber Workforce Development Roadmap – June 2020

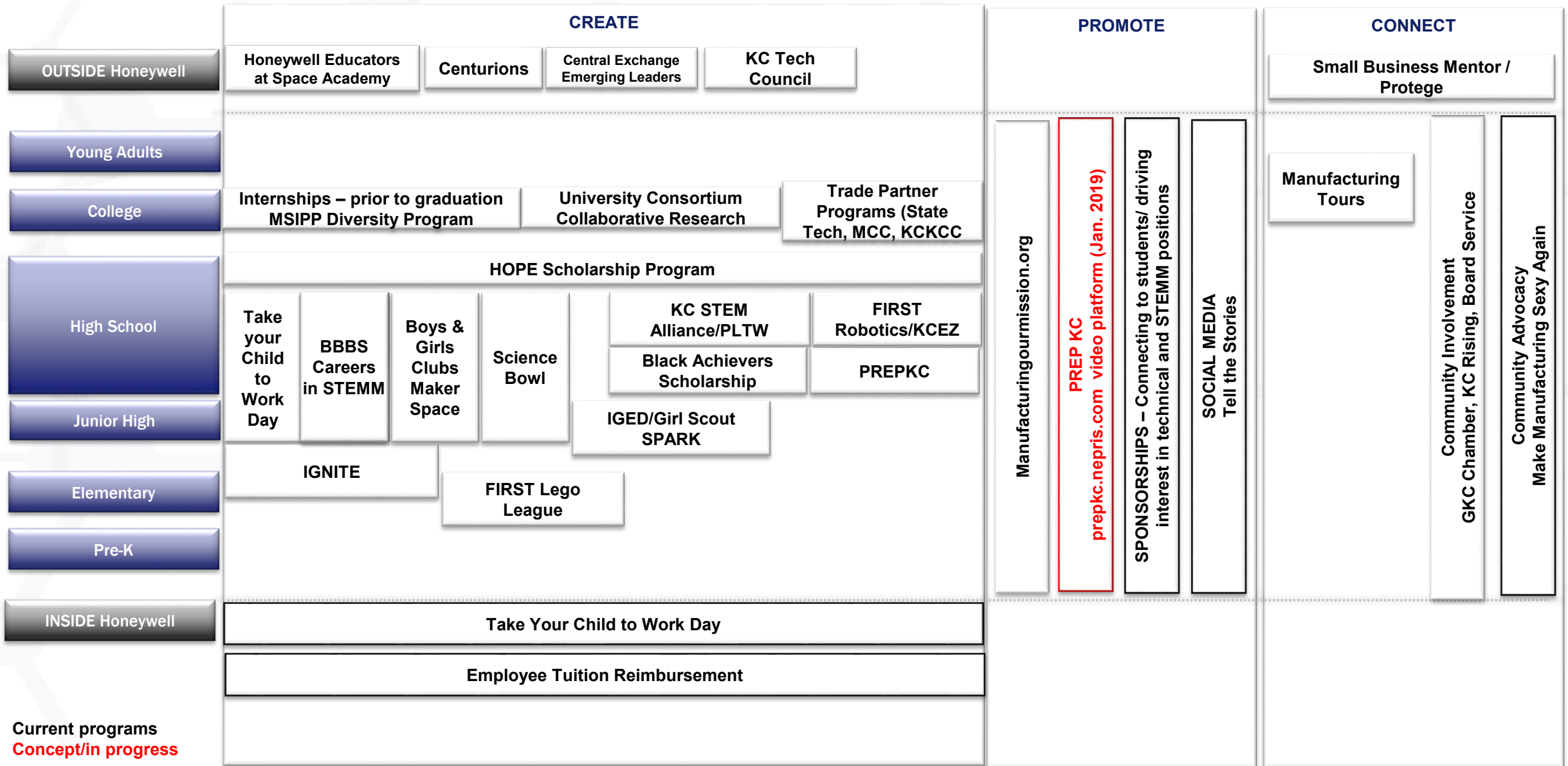


# KC Chamber Workforce Development Roadmap – May 2019





# Honeywell Programs – Pipeline to HOPE Rewarding Careers for the Next Generation



Current programs  
 Concept/in progress

# Livermore Valley Joint Unified School District & Lawrence Livermore National Laboratory

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Lawrence Livermore  
National Laboratory

Working together to provide a robust understanding of and appreciation for STEM education that inspires and cultivates Livermore's next generation of problem solvers & scientists!



LIVERMORE  
SCHOOL DISTRICT

# STEM Education Prioritized at LVJUSD

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- In addition to traditional offerings, students have opportunities for science education related to agriculture, the environment, biotechnology, cybersecurity, & robotics
- Elementary science curriculum begins in 1st grade with instruction from science specialists
- Project Lead the Way, K-12
- Green Engineering Academy (GEA)
- Annual District Science Odyssey





# STEM Education Prioritized at LVJUSD

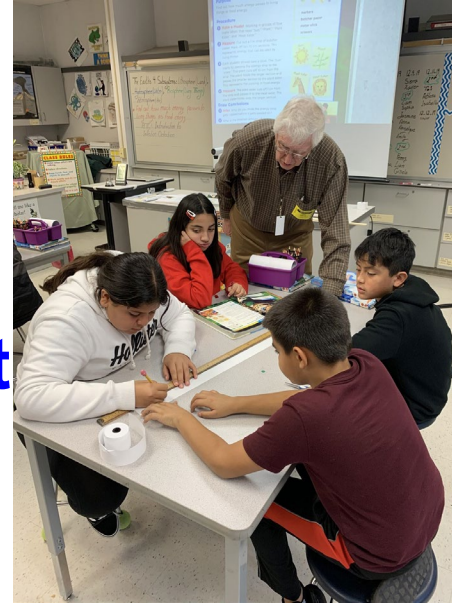
- Lawrence Elementary was named in honor of the Lawrence Livermore National Laboratory and symbolizes the importance of STEM in our school district and our community.



# LLNL Supports our Students & Staff

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- **Brings Real-World Expertise to the Classroom**
  - TOPS Science Volunteers
  - In-person and Virtual Field Trips
- **Supports Clubs & Extracurricular Programs**
  - Girls Who Code Instructors
  - Mathcounts & Robotics Coaches
- **Provides Student Internships & Externships, and Teacher Professional Development**





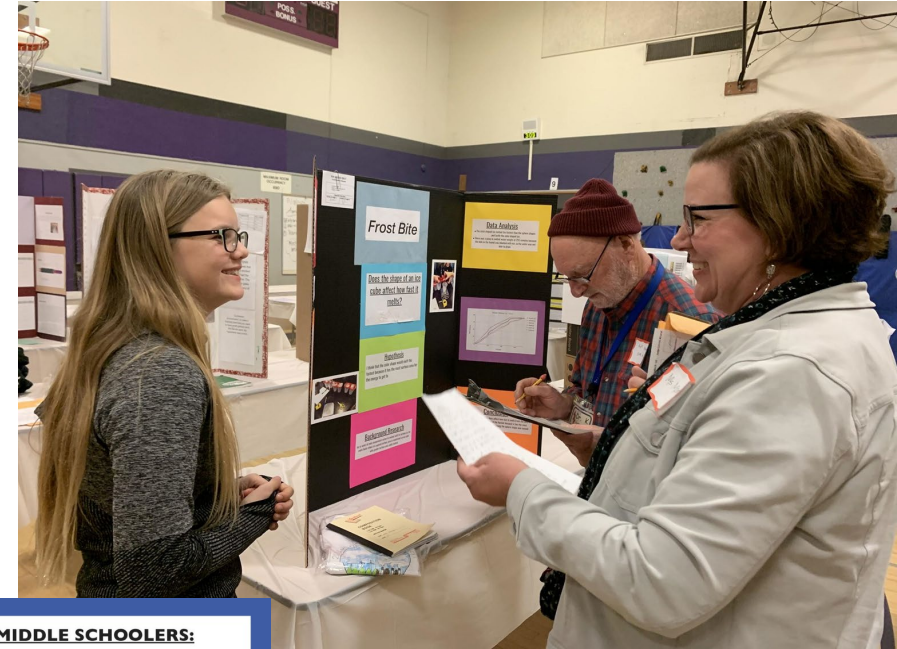
# LLNL Supports our Students & Staff

- **Participates in District Events & Student Outreach**

- Science Odyssey, Calculus Camps
- STEM Day, Manufacturing Day
- Career Days
- African American Scientific Forum
- Ask a Scientist Program
- Expanding Your Horizons

- **Scholarships & Donations**

- Edward Teller Scholarship
- CTE Equipment Donations
- Makerspace, Planetarium, and STEAMLab Sponsor



<p><b>FOR HIGH SCHOOLERS:</b></p> <p><b>LIVE: Tuesday May 12</b> 1pm-2pm</p> <p>10:03</p> <p><b>Backyard Craters With a Planetary Physicist</b> Megan Bruck Syal, LLNL Planetary Defense Physicist <b>Watch video:</b> <a href="https://www.youtube.com/watch?v=0-RxuXN8xCo">https://www.youtube.com/watch?v=0-RxuXN8xCo</a> <b>Submit Questions By:</b> Friday, May 8 <b>Register for Webinar:</b> <a href="https://us02web.zoom.us/webinar/register/WN_YOGEgw2tRtRydy97Ox0kq7Q">https://us02web.zoom.us/webinar/register/WN_YOGEgw2tRtRydy97Ox0kq7Q</a></p>	<p><b>FOR MIDDLE SCHOOLERS:</b></p> <p><b>LIVE: Thursday May 14</b> 1pm-2pm</p> <p><b>Staying Entertained with Physics!</b> Leland Ellison, LLNL Computational Physicist <b>Watch video:</b> <a href="https://www.youtube.com/watch?v=DEvGdMghLU">https://www.youtube.com/watch?v=DEvGdMghLU</a> <b>Submit Questions By:</b> Monday, May 11 <b>Register for Webinar:</b> <a href="https://us02web.zoom.us/webinar/register/WN_pewrDDZ0ZjYHdye5">https://us02web.zoom.us/webinar/register/WN_pewrDDZ0ZjYHdye5</a></p>
<p><b>SCIENCE AT HOME:</b> Make Your Own Atmospheric Model</p> <p><b>LIVE: Tuesday May 19</b> 1pm-2pm</p> <p><b>What Does an Atmospheric Scientist at LLNL Do?</b> Jessica Osuna, LLNL Atmospheric Scientist <b>Watch video:</b> <a href="https://www.youtube.com/watch?v=FmxACoEH_O0w">https://www.youtube.com/watch?v=FmxACoEH_O0w</a> <b>Submit Questions By:</b> Friday, May 15 <b>Register for Webinar:</b> <a href="https://us02web.zoom.us/webinar/register/WN_lj7adN1b5FC03U6_xm1QO">https://us02web.zoom.us/webinar/register/WN_lj7adN1b5FC03U6_xm1QO</a></p>	<p><b>LIVE: Thursday May 21</b> 1pm-2pm</p> <p><b>Edible Aquifer Experiment</b> Monique Warren, LLNL Environmental Engineer <b>Watch video:</b> <a href="https://www.youtube.com/watch?v=9xDpZrMVAI4">https://www.youtube.com/watch?v=9xDpZrMVAI4</a> <b>Submit Questions By:</b> Monday, May 18 <b>Register for Webinar:</b> <a href="https://us02web.zoom.us/webinar/register/WN_THlh-cY2QcCI93Gd7dF">https://us02web.zoom.us/webinar/register/WN_THlh-cY2QcCI93Gd7dF</a></p>





# LLNL Supports Our Community

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- Livermorium Day
- Participation in Innovation Fair
- Science on Saturdays
- Partnership With Quest Science Center
- Representation in Local Organizations
- Support & Mentoring for Robotics and Coding Competitions
- Grants for Schools & Community



LLNL PRESENTS:  
SCIENCE ON SATURDAY

## MONITORING MICROBIOMES

DETECTION ON THE INTERNATIONAL SPACE STATION

SATURDAY, FEBRUARY 29TH  
9:30 & 11:15 am  
Bankhead Theater

- Free one-hour presentation by LLNL Scientists Crystal Jaing & Nick Be with Katherine Wang, Dougherty Valley HS
- Intended for middle & high school students

For more information: [education.llnl.gov](http://education.llnl.gov)





**“A picture is worth a thousand words.”**

The strong LLNL and LVJUSD partnership has enriched and transformed thousands of students lives and enhanced their future prospects.



— October 14, 2020

# Skilled KC Technical Institute

A different kind of institution





## Why Skilled KC?



### **Student-focused**

High graduation rate (85%)

High job placement rate (80%)

Low or no student debt (100%)



### **Employer-driven**

Programs are based on regional job market.

Employers define priority professional & technical skills.

Curriculum is mapped backward from what employers need.



### **Nimble and adaptive**

Reviewed and refreshed with employers continuously.

Programs will start and stop in real-time – CWAC model

Regional, employer, and student data drives decisions.

Partner Companies



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## Testimonials

“ Skilled KC changes trajectories, ignites interest in tech and enriches our industry for the better.

Karla Lowe  
COO, KC Tech Council







“

Skilled KC is helping change the game for those who want to re-skill in our community and be a part of a growing industry.

Matt Sharples  
CEO/Founder, TriCom

**Thank you**





**THE OHIO STATE UNIVERSITY**

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Partnership between DOE and institutes of higher  
education

Marat Khafizov, Associate Professor  
Department of Mechanical and Aerospace Engineering

AUTM University Tech Partnership with DOE

October 14, 2020



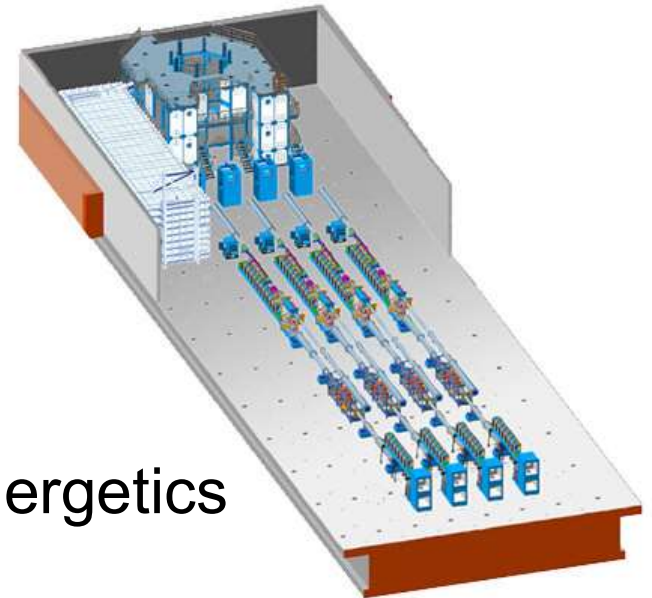
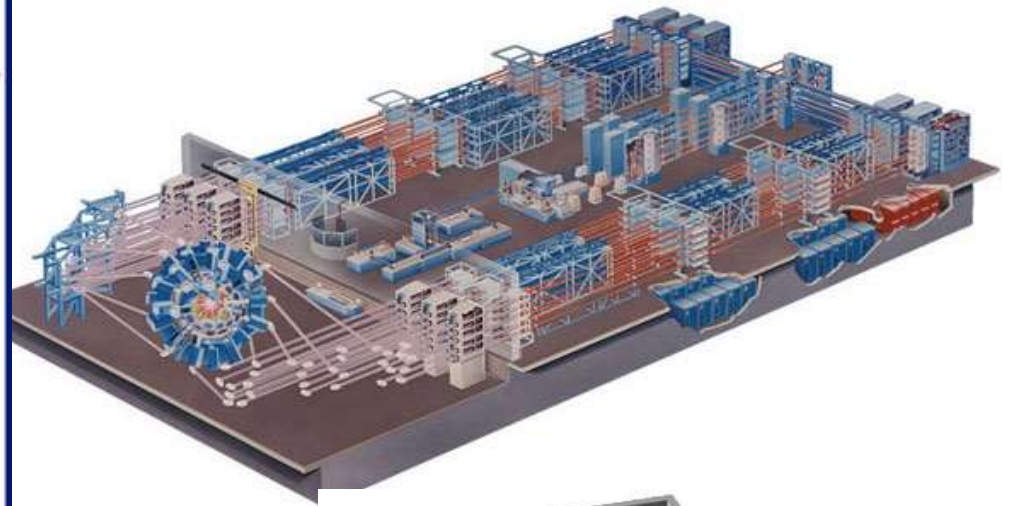
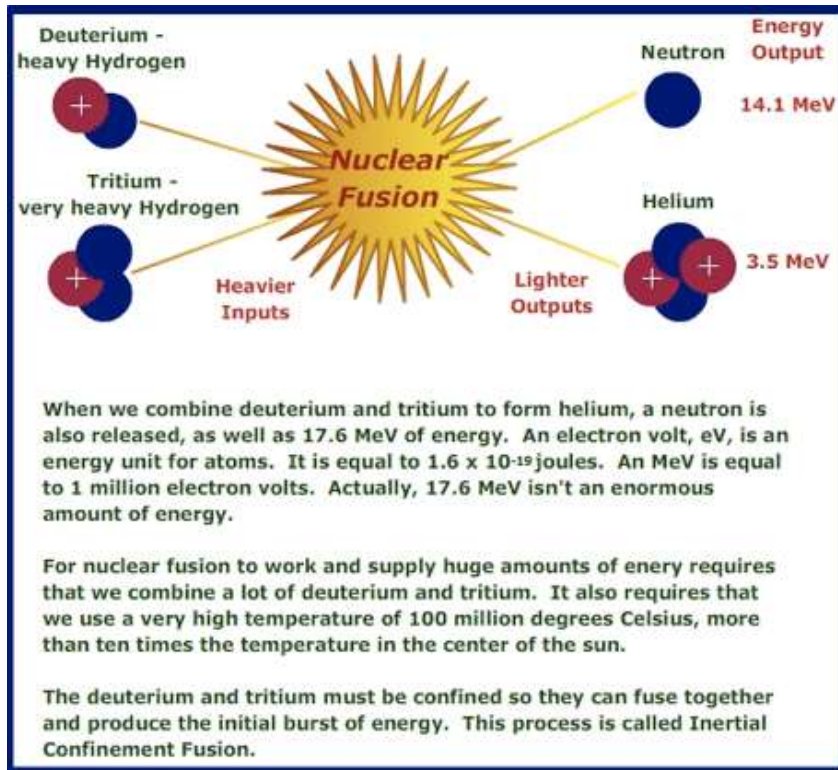


## Overview

- Exposure to DOE research during
  - graduate education
  - postdoctoral research
  - time at Idaho National Laboratory
  - collaboration with DOE Labs as a university faculty
- Research funding from DOE
  - Basic Energy Science, Office of Science
  - Energy Frontiers Research Center
  - Office of Nuclear Energy
  - Laboratory Directed Research and Development (LDRD)

# Laboratory for Laser Energetics

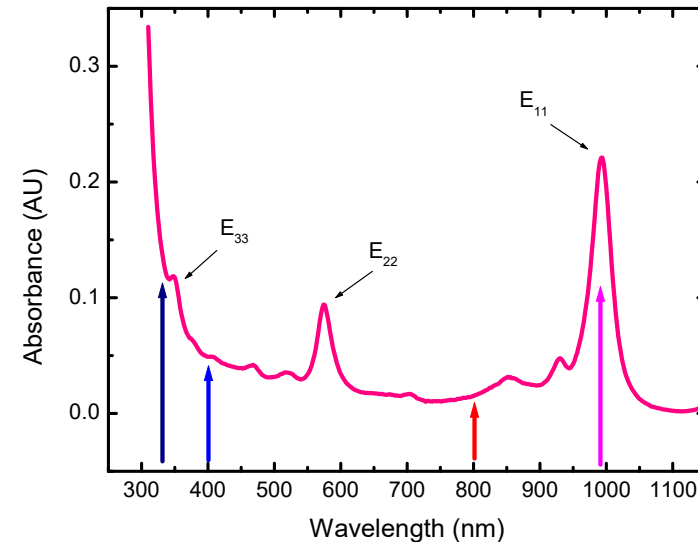
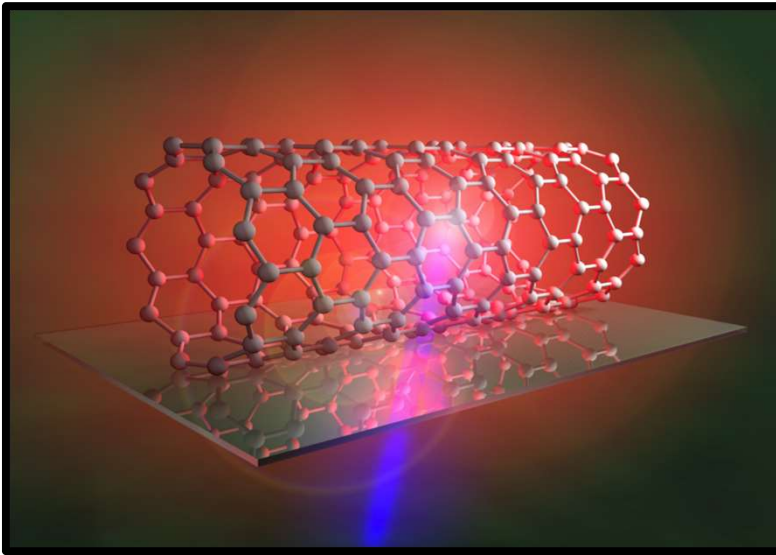
a unique national resource



Graduate work at Laboratory for Laser Energetics  
at University of Rochester (DOE NNSA)



## Carbon nanotubes for photovoltaic applications



- DOE Basic Energy Sciences supported postdoc experience at University of Rochester 2008-2010
- LANL and NREL were key players in this research area





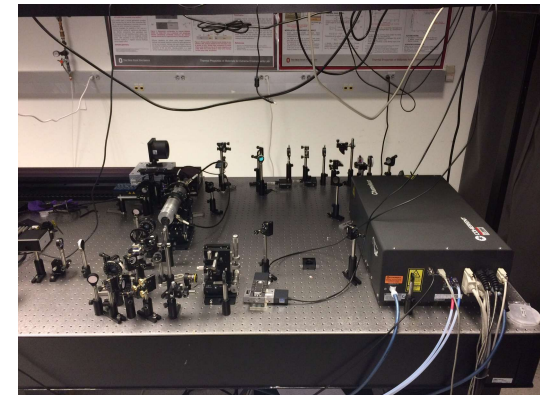
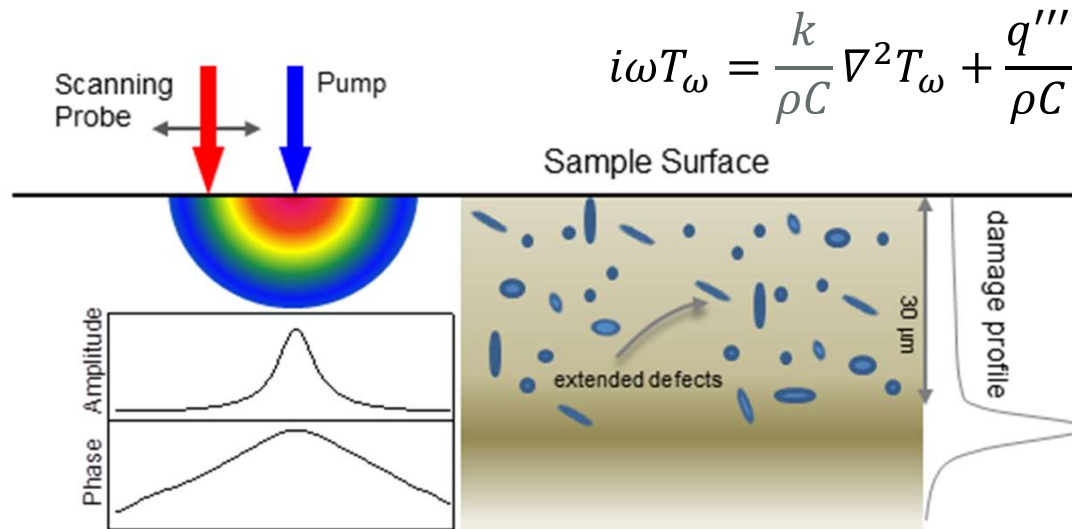
## Idaho National Laboratory



- DOE's Office of Nuclear Energy
- Started as a postdoc, converted to staff ( 2010-2014)
- Primarily performed research under BES EFRC – Center for Thermal Energy transport
- Some exposure to NE energy research



## Modulated thermoreflectance methods



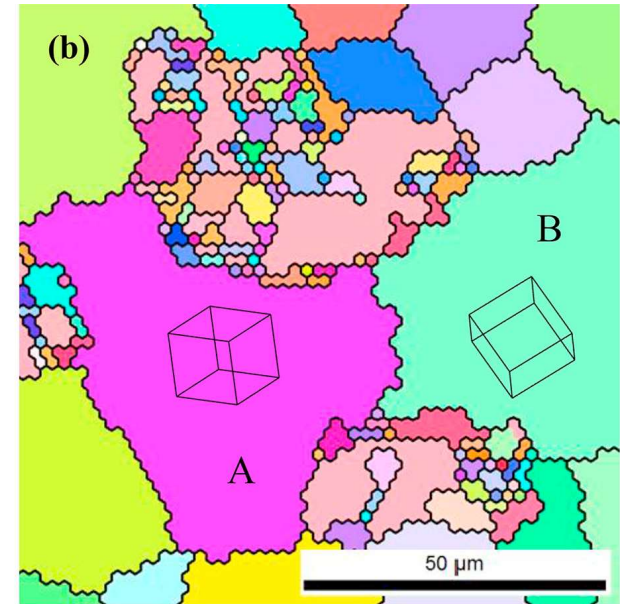
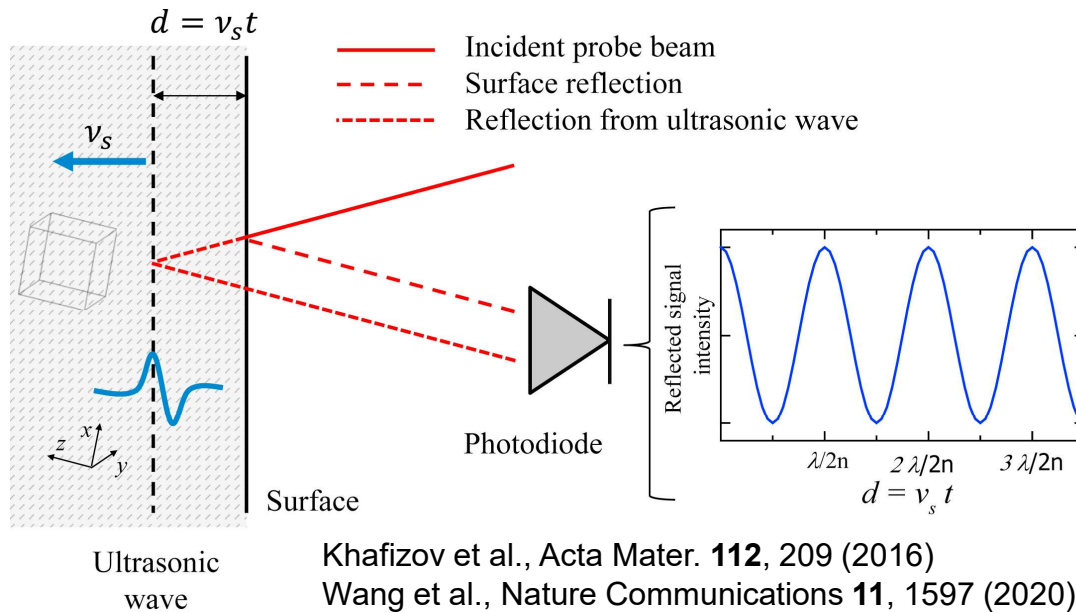
Hurley *et al.*, Rev. Sci. Instrum. 86, 123901 (2015)

Khafizov *et al.*, J. Mater. Res. 32, 204 (2017)

- Unique aspect of the method allows collaboration with US national laboratories (INL, LANL)



# Ultrasonic measurement of grain orientation

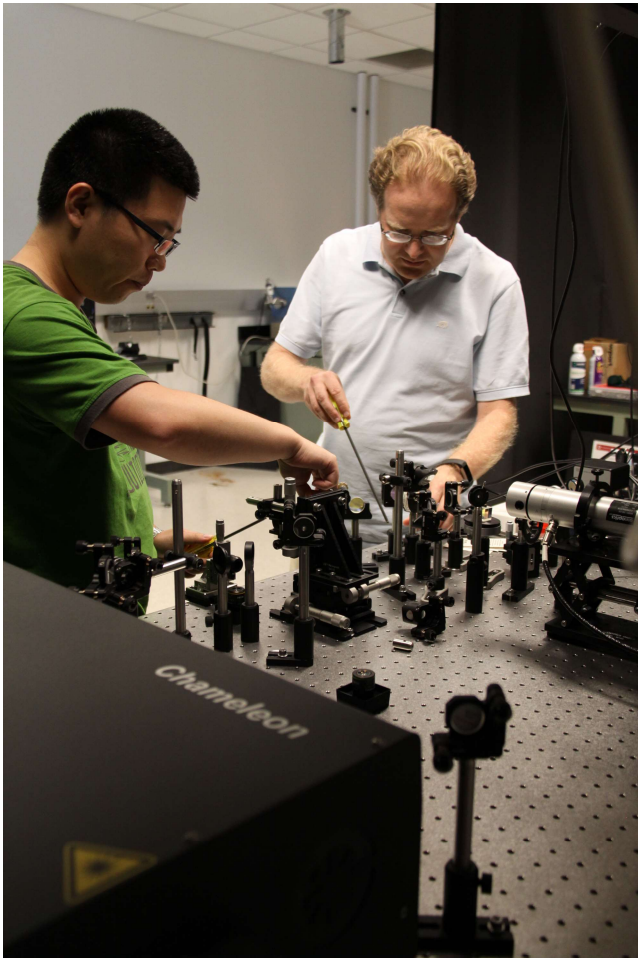


- Propagating acoustic wave gives rise to transient oscillatory feature attributed to **interference** between two optical beams incident on a photodiode
- In picosecond acoustic grain orientation dependent sound velocity in individual grain is measured
- Graduate student spend time at Idaho NL. Now a postdoc at INL





## Collaboration with DOE labs as a faculty



- Center for Thermal Energy Transport under irradiation – BES Energy Frontiers Research Center (EFRC)
  - Phonon thrust lead
  - Lead by Idaho NL in partnership with Oak Ridge NL, Ohio SU, Purdue U, Columbia U, U Central Florida, and AFRL.
- Irradiation behavior of piezoelectric materials – NEUP
  - In partnership with Missouri S&T and Idaho NL
- Co-organized workshops with Oak Ridge and Idaho NLs



## **The Ohio State University**

- **1st** among Ohio publics in academics
- **4<sup>th</sup>** among the nation's most industry-sponsored research expenditure (13 total)
- **16<sup>th</sup>** among the nation's best public universities in *U.S. News & World Report's* 2018 edition of "America's Best Colleges"
- **11** graduate programs ranked in the top 10 by *U.S. News & World Report*
- **66,046** students enrolled
- **\$534.6 million** total research expenditures with **7,196** faculty across 15 colleges
- Discovery themes: *Materials and Manufacturing for Sustainability* and *Translational Data Analytics*



## Department of Mechanical and Aerospace Engineering

- Enrollment
  - **1560** undergraduate students
  - **160** master students
  - **210** PhD students
- **64** total faculty
- **\$22.5 million** research expenditure in 2017 (government/industry)
- Major research centers
  - Center for Automotive Research
  - Aerospace Research Center
  - Center for Design and Manufacturing Excellence
  - Institute for Materials Research
  - Nuclear Research Reactor







## Nuclear Engineering Program



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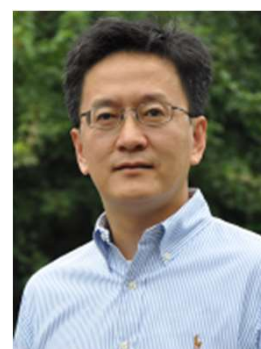
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Thomas Blue  
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[blue.1@osu.edu](mailto:blue.1@osu.edu)



## Benefits to academia



- Internship opportunities for university students
- Use of world-class facilities at DOE labs to support their thesis work
  - OSU NE grad students conducting research at Idaho and Sandia NLs
- Joint publications
- Post-graduation employment opportunities
  - OSU NE recent graduates have joined Oak Ridge, Idaho, Argonne and Sandia, DOE HQ

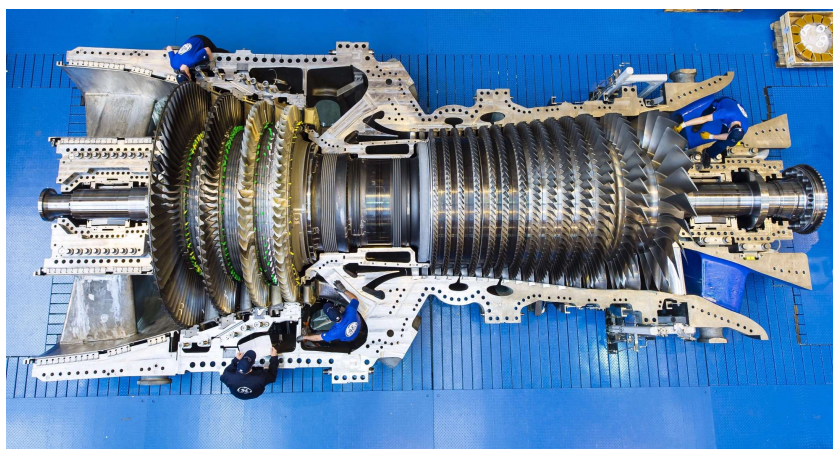


THE OHIO STATE UNIVERSITY



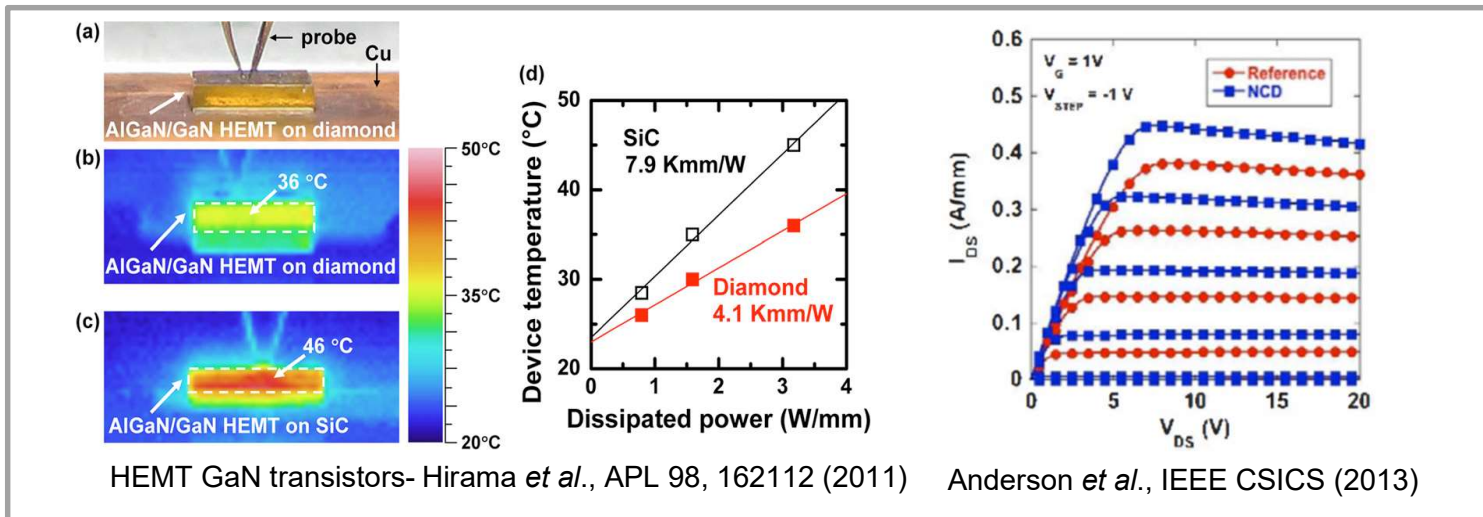
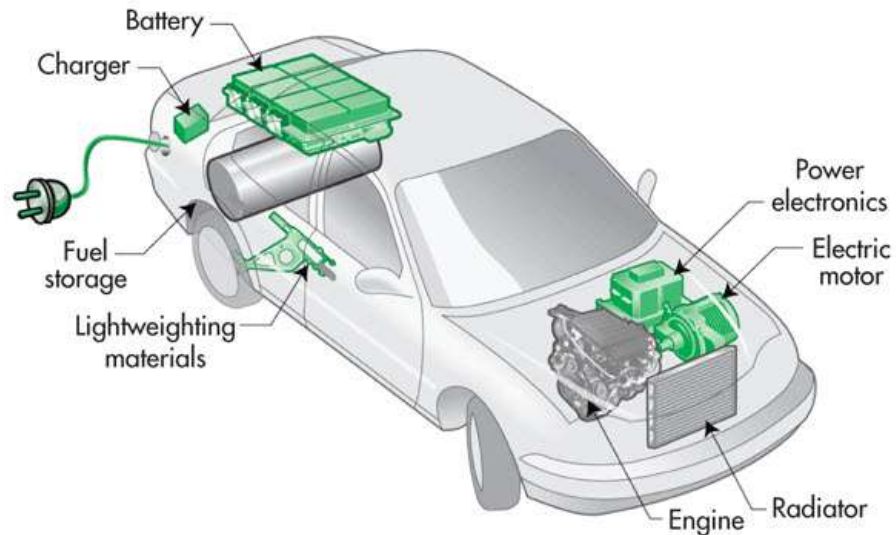


# Thermal management in energy applications





# Thermal management of electronic devices





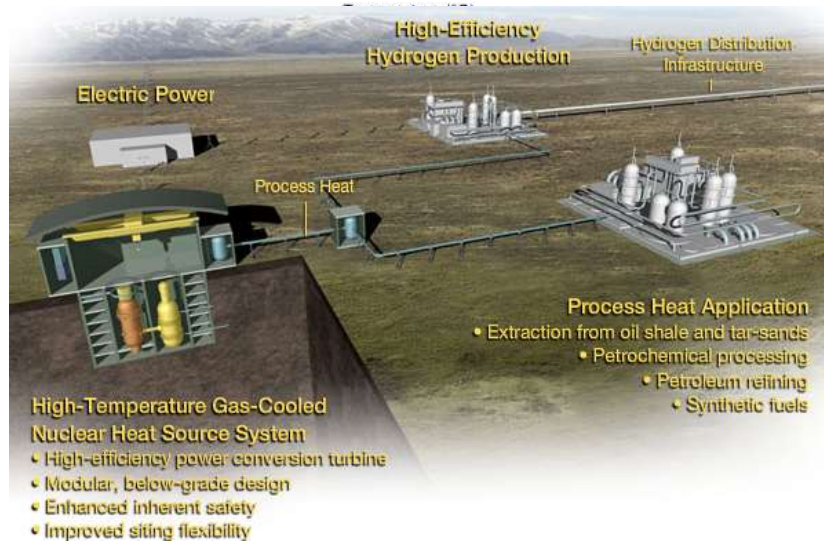


# Nuclear Energy for Industrial Heat

## Advanced Nuclear Industry: Next Generation



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In addition to electricity production, advanced reactors offer high temperature process heat for hydrogen generation and chemical processing that can benefit Ohio's advanced manufacturing (steel), fertilizer production, oil refining and polymer industries

Ohio's R&D and manufacturing capabilities make it attractive for new reactor construction





## Personal background

- 2008, PhD in Physics - Department of Physics and Laboratory for Laser Energetics, University of Rochester
- 2010, Postdoctoral Scholar - Department of Chemistry, University of Rochester



UNIVERSITY of  
ROCHESTER

