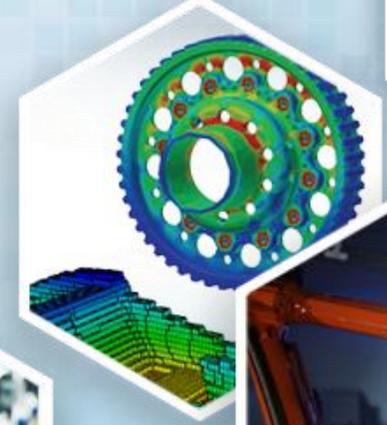


Composite and Beyond – Training the Advanced Manufacturing Workforce of the Future

Joannie A. Harmon

Workforce Director



IACMI Winter Members Meeting Jan 17, 2021

- Workforce Development Milestones & Evolution
- National Scalable Workforce Development Strategy
- The Future

Meet the Workforce Team



Joannie A. Harmon
Workforce Director



Tyler Blevins
Workforce & Community
Development Manager



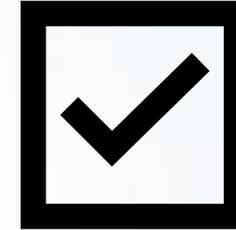
Emily King Kinsey
Workforce
Communications

IACMI Workforce Development Evolution from 2015 to Present



2015 Vision

- Composites Workshops – 4 per year / 5 years / Goal 500 participants
- Internship program – 15 students per year hosted at core university partner sites / 4 years / Goal 60 appointments
- STEM: local workshops with UTK and ORNL



Outcomes and Present State of Workforce Development

Adult Learners served 2015-2020

- Composites Workshops – Trained **1,774** workers
- Apprenticeship occupational framework approved; partnership with Apprenticeship Works

Student Learners served 2015-2020

- Internship program – **119** appointments, **47,600** participation hours, **25** unique host sites
- Undergraduate and Graduate **621** participants
- STEM **8,321** participants

Programs

- Advanced Composites Career Pathways Program (ACCP) for technician training
- Skill Crafters STEM program
- ACE CNC Machining Tool program
- AR/VR integration
- Online learning modules
- Elevate by IACMI workforce brand developed

IACMI Interns Making Impact in Composites



IACMI Interns Making Impact in Composites

<https://youtu.be/0-7MduBHIHY>

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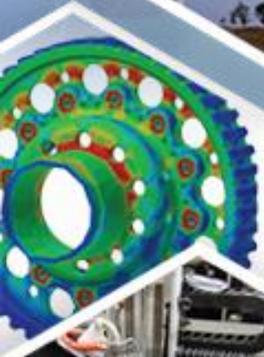
119 appointments,
47,600 participation hours
40 Partner placements
25 unique host sites

“Loving it in RI and TPI is pretty much spot on for what I wanted to do right out of college.

Thank you, Joannie. I know how hard you worked to help find a good place for me, and I really appreciate it.”

Darren Foster,
2018-2019 Intern on Ford Dow Project

National Scalable Programming



Local Delivery, National Impact



Objective: Create a network of regionalized training programs that are based on national standards and serve important ecosystems for strengthening the industrial manufacturing supply chain and our nation.

Framework for Systematic Implementation Process

- Identify regional opportunities
- Qualify for delivery and success
- Prioritize for implementation
- Execute with local ownership
- Connect via national network to assess and maintain
- Regionalized to facilitate ownership and sustainability by local ecosystem

Key Elements

- Best practices
- Common standards
- National credentials
- Customization to regional needs
- Industry-based qualification
- AR/VR simulations to economize introductory programming
- Emphasis on hands-on learning experiences for manufacturing

Elevating the Workforce of the Future, Today



SkillCrafters[™]
BY IACMI

SkillCrafters[™] Express
BY IACMI

accp[™]
BY IACMI
Advanced Composite
Career Pathways

STEM K-12

Outreach and Awareness

- Deploy in high school and middle school classrooms
- Playbook for advanced composites technology
- Videos professionally produced
- Modular learning content
- Two delivery formats – traditional and accelerated
- NextFlex leading in partnership with 9 other MUSA Institutes

Technician and Career Level Advanced Composites Career Pathways

- Deploy in key locations within the Industrial Manufacturing Supply Chain
- Customized to regional needs
- Industrial based qualifications
- Aligned to labor market demands
- Immersive learning experiences
- Connected national network
- Scalable model

 **Elevate**[™]
BY IACMI

www.elevatebyiacmi.org

***Revitalizing
U.S.
Manufacturing***



America's Cutting Edge (ACE) CNC Machining Training Program

- National initiative for machine tool technology development and advancement
- Supported by the Department of Defense (DOD) Industrial Base Analysis and Sustainment (IBAS) Program from the Office of Industrial Policy
- Decline in U.S. machine tool capacity is significantly impacting U.S. manufacturing
- 27% of the manufacturing workforce to retire in 10 years
- CAM simulation software is geometry-focused and neglects the process physics, so trial and error practices remain, reducing productivity and increasing cost

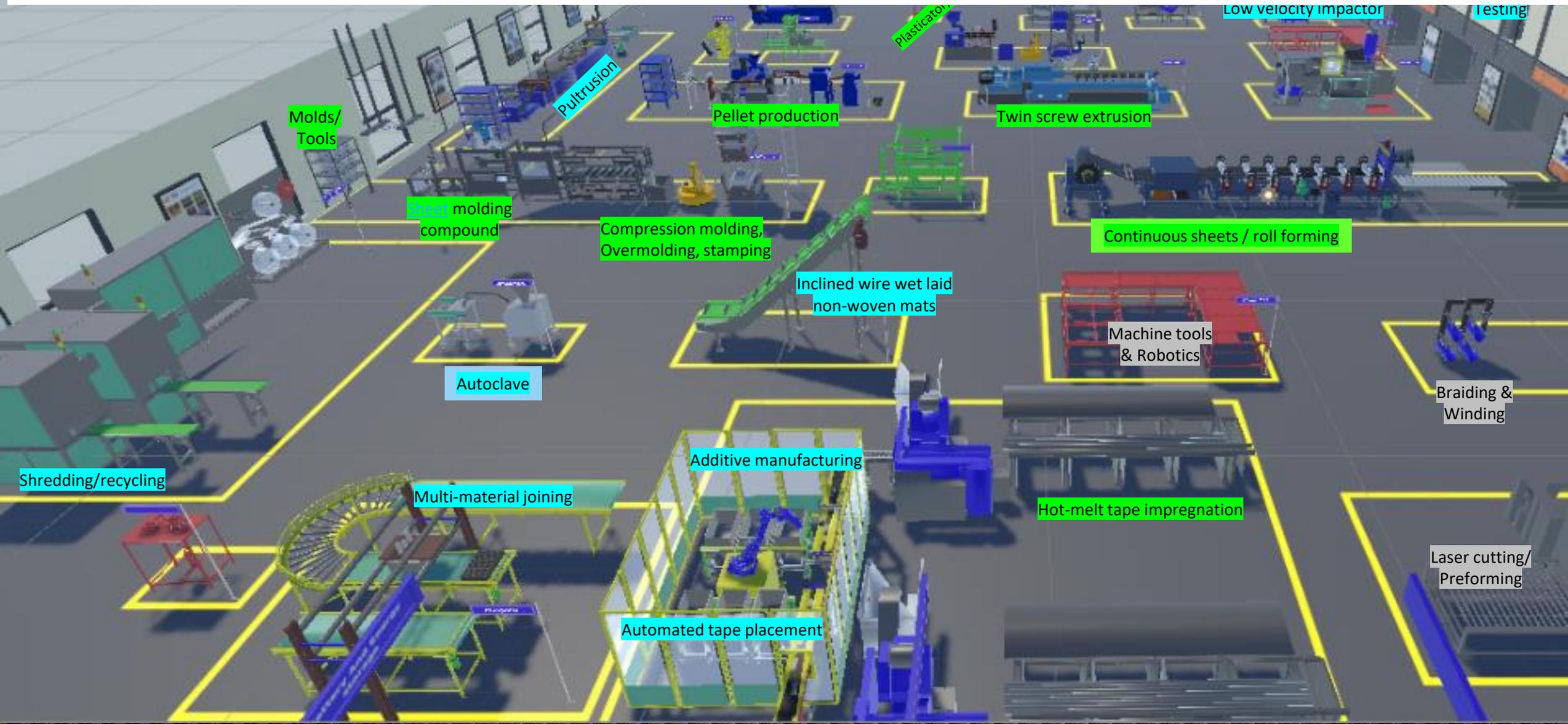
Phase I Partners

- IACMI-The Composites Institute
- Oak Ridge National Laboratory
- The University of Tennessee
- Pellissippi State Community College
- Connecting innovation to workforce development sooner for greater impact

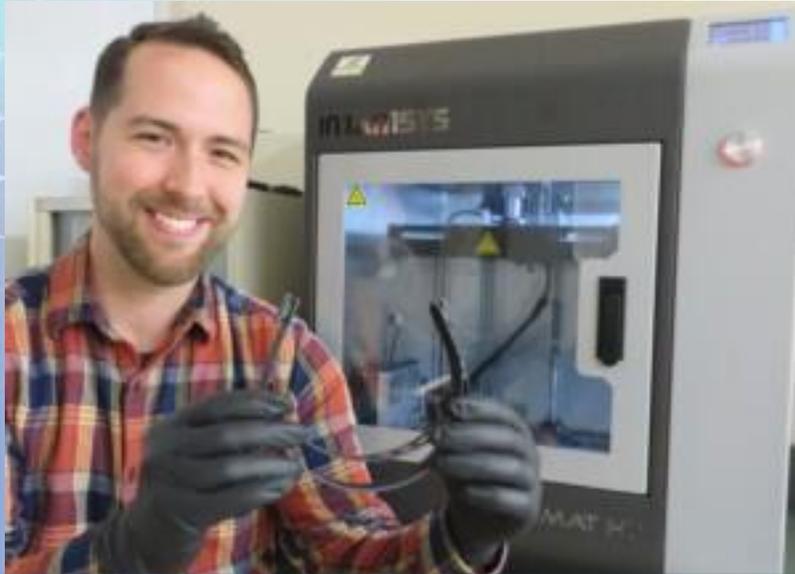
ADVANCED COMPOSITE MATERIALS & MANUFACTURING

Connecting Digital to Physical

Advanced manufacturing facility at University of Tennessee – in progress



Creator Makers Solve Complex Problems



Dream | Design | Deliver

COVID19 Rapid Response

- 1,500 face-shield parts in 3 days
- Medical professionals and front-line workers
- Crowd sourcing, information sharing
- Maker spaces, classrooms, labs, and in homes,
- Connectivity among current students, alumni, various departments, state responses teams, and more
- Being part of the solution – Civic minded



“There is a huge community of 3D printer users dedicated to open-source innovation. Some share print settings and printer upgrades, while others respond with innovative product designs. They had these designs for face shields posted early. This was already something that was on the radar for these people at home with their printers.” - Alex Stiles, Univ of TN, PhD student

Creator Makers Solve Complex Problems



Friendship Bell Project

- 8,300-pound bronze cast bell on 33-ft long foam core beams wrapped in carbon fiber
- Collaboration of ORNL, UTK, IACMI, Highland Composites, Community of Oak Ridge, and Cincinnati Inc.
- 10 Undergraduates and 15 Graduate Students led by Dr. Vaidya
- 2019 CAMX Awards for Composites Excellence (ACE) Most Creative Application



Creative problem solving
Critical thinking
Work ethic
Communication skills
Dream | Design | Deliver



Creator Maker Nation



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