

# CIVS Newsletter

August 2022

*"Where Ideas Become Reality"*

Issue 31



CENTER FOR INNOVATION THROUGH  
VISUALIZATION & SIMULATION

PURDUE  
UNIVERSITY  
NORTHWEST



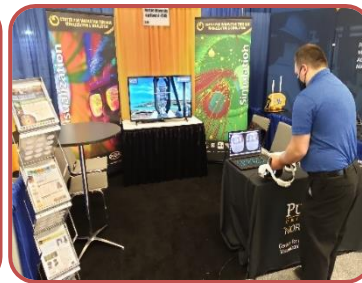
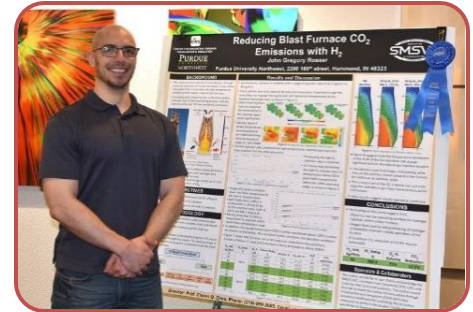
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## CIVS Highlighted at AISTech 2022

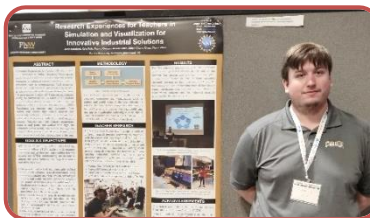
Twelve CIVS faculty, staff, and students attended AISTech 2022 from May 16-18 in Pittsburgh, PA, winning 3 prestigious awards, presenting 8 technical papers, and demonstrating CIVS projects in an exhibition booth at this industry's premier technology event with a near record number of over 8000 professionals in attendance. [More...](#) CIVS awards include: 1st place for the Graduate Student Poster Contest for CIVS student John Rosser, [More...](#) the AIST Hunt-Kelly Best Paper Award, 3rd place, for the Smart Ladle project, [More...](#) and AIST Distinguished Member and Fellow for CIVS Director, Dr. Chenn Zhou. [More...](#)



## Second NSF RET Six-week Summer Teacher Program

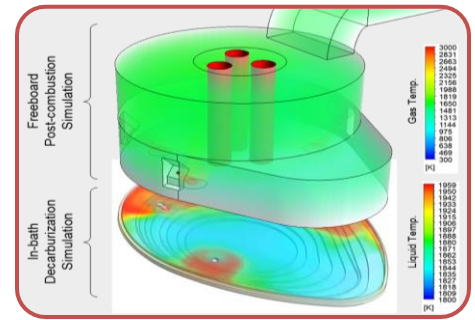
Welcome, 11 NSF RET High School and Community College teachers! CIVS hosted the NSF RET six-week Summer Program second year in a row. The opening ceremony was held

in the CIVS Theater on June 13. [More...](#) Teachers visited U. S. Steel Gary Works to experience a real-world steel plant and worked on research projects and virtual teaching simulators. [More...](#) CIVS researcher Kyle Toth presented the RET outcome at the ASEE 2022 on June 27. [More...](#)



## CIVS EAF Models Published in Two Top Journals

Applied Thermal Engineering & Metallurgical and Materials Transactions B published CIVS research papers entitled “Effect of coherent jet burner on scrap melting in electric arc furnace” and “Simulation of Scrap Melting Process in an AC Electric Arc Furnace: CFD Model Development and Experimental Validation” authored by CIVS Ph.D. student, Yuchao Chen, and co-authors. [More...](#)



## CIVS Supported BP Summer Camps and PNW New Student Orientation

CIVS supported a number of outreach activities during the summer including BP Summer Middle and High School Engineering Camps and PNW New Student Orientations with over 100



attendees. The events showcased CIVS technologies to stimulate students’ interest in engineering. [More...](#)

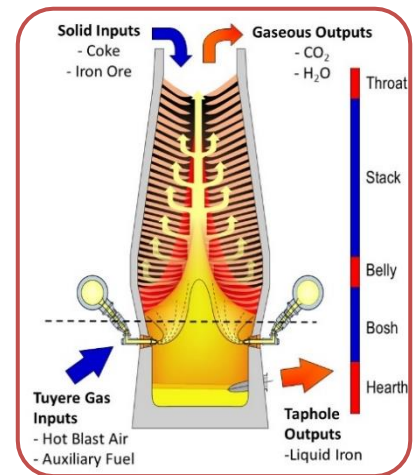
## CIVS Awards for Smart Ladle Project Highlighted in NWI Times

The Times of Northwest Indiana Newspaper published an article in the Business Headline on April 15, entitled “Purdue Northwest researchers win Association for Iron & Steel Technology awards.” for the Smart Ladle paper and Dr. Zhou’s AIST Fellow. [More...](#)



## CIVS Presents Digital Twin, Hydrogen Combustion, and other Research Projects in Various Conferences

CIVS Research Associate Professor, Dr. Tyamo Okosun delivered a lecture at the 26th McMaster University Blast Furnace Ironmaking Course on May 12. [More...](#) Dr. Chenn Zhou was invited to present Caster Digital Twins at the Smart Manufacturing Experience on June 7. [More...](#) Research Associate Professor, Dr. Armin Silaen showed the use of hydrogen to reduce CO<sub>2</sub> emissions in reheat and blast furnaces at the CMSS on July 23. [More...](#) Senior Research Engineer Nick Walla presented the Lead Reverberatory Furnace model at the SHTC on July 12. [More...](#)



### Student Success Story: Dr. Yuchao Chen

Yuchao Chen, a research assistant at CIVS, received his Doctoral degree after successfully defending his thesis entitled “Integrated Multi-physics Modeling of Steelmaking Process in Electric Arc Furnace” at Purdue University WL. Yuchao received a BS degree from Central South University in 2016 and MS degree from PNW in 2018. Yuchao said, "It has been an incredible experience to be a member of the CIVS family. I greatly appreciate not only the precious research opportunities provided but also the versatile and resourceful colleagues I have here that I will benefit from for a lifetime." [More...](#)



### NiSource Vice President Visit

Kelly Carmichael, Vice President of Federal Government Affairs, Environmental and Sustainability at NiSource visited CIVS on July 8 to discuss ongoing projects, the Steel Manufacturing Simulation and Visualization Consortium, and future collaborations. [More...](#)

### CVIS Students Won Four 3MT Competition Awards

CVIS staff and students participated in the Days of Discovery and 3 Minutes Thesis (3MT)



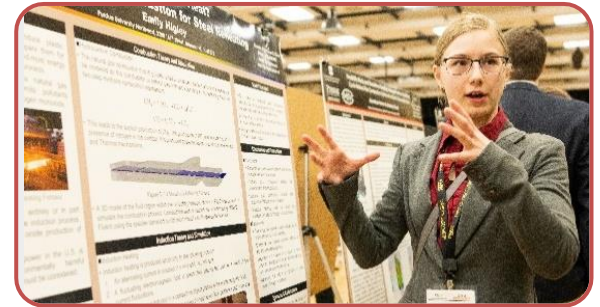
competition from April 6 - 7, with 22 posters and one oral presentation. [More...](#)

Congratulation to CIVS research students who won four out of the five awards. Graduate Group Winners (tie): Chukwunedum Uzor and Congshan Mao; Undergraduate Group Winner: Kevin Davis, and Runner-up: Mateo Garcia. [More...](#)

### CVIS Visits Charter Steel and Cleveland-Cliffs for Smart Ladle and Safety Training Simulator

CVIS Researchers visited Cleveland-Cliffs Indiana Harbor on April 19 for the Smart Ladle project. Dr. Judy Li, Lead Process Research Engineer hosted the visit. [More...](#)

CVIS Staff and students visited Charter Steel in Saukville, WI on July 1. They were warmly welcomed by Matt Liddick, the SMSVC Board member. [More...](#)



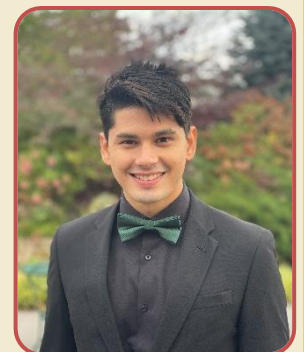
### Material Advantage Students Network at AIST Dinner



CVIS staff & students met Frank Mrvan, the representative for Indiana's 1<sup>st</sup> congressional district, at the AIST Midwest Chapter monthly dinners on April 12. Congressman Mrvan shared on Facebook: "It was great to meet with Purdue Northwest students and Dr. Chenn recently at the AIST Midwest Chapter meeting in Merrillville. Thank you for your efforts to support domestic manufacturing, and I wish all of you the best in your continued studies." [More...](#)

### Student Success Story: Saswot Thapa

"Application is the best practice to retain knowledge. While working at CIVS, I was able to apply the fundamental engineering theories learned in class which provided me with the crucial experience necessary to enter the aerospace industry," said Saswot Thapa, a CIVS graduate research assistant, who recently defended his thesis titled "Numerical Study of Fluid Flow and Solidification in the Primary Cooling Zone of a Continuous Caster". Saswot will be joining the Boeing Company as a flight engineer. [More...](#)



## SMSVC Hosts a Successful Hybrid Semi-Annual Meeting

The Steel Manufacturing Simulation and Visualization Consortium (SMSVC) held its Semi-Annual meeting on April 20-21. Around 90 attendees from member companies and CIVS and members joined together to review SMSVC projects. [More...](#)



### SMSVC NOTES

**Annual Meeting**  
**November 9 - 10, 2022**

#### SMSVC Accepting New Members

SMSVC is accepting new members. If interested in becoming a member, please contact [steelcons@pnw.edu](mailto:steelcons@pnw.edu)

For more information on the Consortium, visit [steelconsortium.org](http://steelconsortium.org).

## U. S. Steel Team Visit for U. S. DOE IVBF Project

The U. S. Steel team visited CIVS to discuss the implementation of the casting rate sensor as part of the IVBF project on June 14. CIVS Director Dr. Zhou and Research Associate Professor Tyamo Okosun, welcomed all attendees from USS, PUWL, and PNW. Detailed discussions were made on the hardware and for the newly developed casting rate sensor to measure casting flow rate and temperatures. [More...](#)



## CIVS Welcomes Gopher Resource Representatives



CIVS collaborators from Gopher Resource visited CIVS on May 16. VP and CTO Joe Grogan and Senior R&D Engineer Dr.

Allie Anderson were welcomed by CIVS Senior Research Engineer Nick Walla. They reviewed CIVS technologies and projects. They also discussed the current and future stages of our collaborated Lead Reverberatory Furnace project. [More...](#)

## Cleveland-Cliffs Tour for U. S. DOE IVBF Project

On June 20, the IVBF project team visited Cleveland-Cliffs Indiana Harbor Blast Furnace No. 7, followed by an afternoon project discussion meeting at CIVS for the U. S. Department of Energy Integrated Virtual Blast Furnace project. The team included researchers from Oak Ridge National Laboratory, Linde Corporation, PUWL, and CIVS. [More...](#)



## Facts and Impact (Since 2009)

- \$40+ million savings for companies
- \$35,250,000+ in external grants and contracts
- 170+ external organizations collaborated with CIVS
- 416+ projects
- 670+ national and local news
- 1,790+ students employed and mentored
- 11,550+ students used CIVS for virtual labs
- 150+ Purdue Northwest faculty and staff collaborators
- 290+ student awards and grants (globally, since 2011)
- 36,100+ local and global visitors