

CIVS Newsletter

August 2024

“Where Ideas Become Reality”

Issue 37



Project Team and DOE Representatives Visit Gerdau's Steel Plant for H2 Demonstration in Reheating Furnace

Gerdau hosted a technical kick-off meeting and site visit at its Steel Plant in Monroe, MI for our DOE \$10M project to develop and demonstrate an industrial hydrogen-fired steel reheating furnace. Gerdau's reheating furnace in Monroe, MI will be used as the demonstration site. At the event, Gerdau's President Rodrigo Belloc



warmly welcomed the DOE IEDO representatives and the project team members. A plant tour was given followed by productive project discussions. [Read more...](#)

CIVS Highlighted at AISTech 2024 by 6 Awards and Six Papers



Congratulations to the CIVS students, staff, and faculty on their successful participation in an international steel conference, AISTech 2024, in Columbus, OH in May. CIVS won six awards; 1st & 3rd place in undergraduate presentation contest, 1st & 2nd place in graduate poster contest [Read more...](#) and presented six technical papers and one panel discussion. [Read more...](#)

CIVS Director Highlighted in DOE Profile Series

Dr. Chenn Zhou is featured on the Department of Energy's Industrial Efficiency & Decarbonization Office (IEDO) Industrious Series, which highlights outstanding individuals working with the IEDO office to implement meaningful change in the industrial sector. [Read more...](#)




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2200 169th Street
Hammond, IN 46323

219.989.2765
civs@pnw.edu
www.pnw.edu/civs



New State-of-the-Art CIVS Immersive Theater

CIVS recently upgraded its Immersive Theater, enabling exciting state-of-the-art visualization capabilities, while supporting the center's long-term mission of conducting cutting edge research in visualization and simulation. The more modern 24' x 9' LED curved screen supports a much higher resolution than the old projector-based system with some new features. Since its completion in the middle of July, CIVS project demonstrations in the new facility has already impressed a number of visitors including our PNW Chancellor Dr. Chris Holford & New Provost Dr. Maria Mora, Hydrogen Hub leader Dr. Elizabeth Koch, companies such as Stelco, CN, and other international and local industry leaders, as well as PNW new students. [Read More...](#)



VR Lab Presented at Water Congress and CIVS



CIVS faculty collaborator Dr. Chandramouli Viswanathan presented “Immersive VR Learning Environment from Historic Flood at a Bridge Site” [Read more...](#) This VR Lab has also been used by PNW Civil Engineering students in the CIVS Immersive Theater

as part of the CE 34200 - Engineering Hydrology and Hydraulics course. [Read more...](#)

Lecture at International Ironmaking Course

On May 16, CIVS Associate Director for Research, Tyamo Okosun, and PhD student, Samuel Nielson, lectured at McMaster University. [Read more...](#)



Hydrogen Research Presented at International Conferences

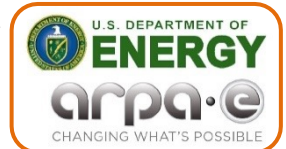
This summer, CIVS researchers presented hydrogen research for iron and steelmaking at multiple conferences: 1) 3rd International Symposium on the Recent Developments in Plate Steels by Nick Walla. [Read more...](#) 2) 48th International Technical Conference on



Clean Energy by Chenn Zhou. [Read more...](#) 3) ASME 2024 Summer Heat Transfer Conference by Armin Silaen. [Read more...](#)

DOE ARPA-E Kickoff Meeting

CIVS Associate Director for Research Tyamo Okosun attended a kickoff meeting for DOE ARPA-e Revolutionizing Ore to Steel to Impact Emissions (ROSIE) program in June in Chicago, IL. CIVS is a partner in an industry-academic team to develop a new method of using microwave-generated hydrogen plasma for ironmaking without generating CO₂ emissions. [Read more...](#)



CIVS Director Presented EAF CFD Modeling at European Electric Steelmaking Conference & Visited Linde Combustion Lab in Germany

Dr. Chenn Zhou presented the state-of-the-art CFD Modeling of Electric Arc Furnace for Process Optimization at the 13th European Electric Steelmaking Conference in June in Essen, Germany. During the trip, she also visited Linde’s very impressive combustion lab in Munich. The combustion lab facility will be used to test flameless H₂ burner performance in our DOE \$10M reheating furnace project. [Read more...](#)



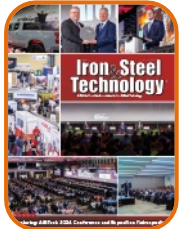
CIVS Hosts NSF RET Teachers for Fourth Year

CIVS hosted its fourth year of the NSF Research Experiences for Teachers (RET) program June 17-August 2. The STEM high school and community college teachers spend six weeks to carry out research using simulation and visualization tools for solving industrial problems and to translate the research experience into their teaching materials.

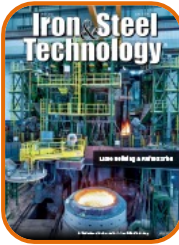
[Read more...](#) They presented at the 2024 NSF RET Virtual Poster Session on July 22-23. [Read more...](#)



Three Technical Papers Published in Iron & Steel Technology

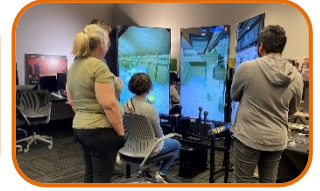


AIST highlighted three CIVS papers in Iron & Steel Technology in July & August issues. These are co-authored by CIVS researchers and industry collaborators including 1) “Decarbonization and Increased Productivity in the Reheating Furnace Using Hydrogen Fuel” 2) “A CFD Study of Alloy Dissolution and Homogenization in Ladle Metallurgy Furnace” 3) “Hazard Recognition Scenario Builder for On-Site Customizable Virtual Training”. [Read more...](#)



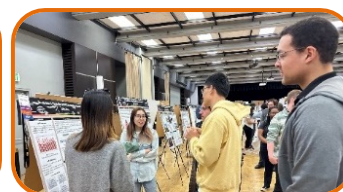
CIVS Showcases at Engineering Summer Camps and Field Trips

CIVS has demonstrated projects and technologies in three engineering summer camps hosted by MCE dept.: 1) ASM Materials Camp for Teachers [Read more...](#) 2) High school student summer camp 3) Middle school student summer camp [Read more...](#) Students at Homewood-Flossmoor High School also visited CIVS on April 23 [Read more...](#)

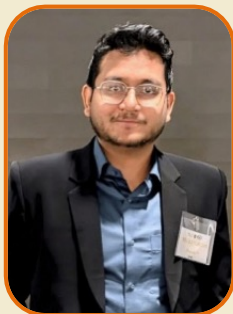


CIVS Students Shine at PNW Day of Discovery and Senior Design Presentations

Over 20 CIVS research students showcased their projects during the 2024 PNW Day of Discovery on April 18. Abhishek Kolakotla won the First Annual Days of Discovery Student Choice Award for the College of Engineering and Sciences for his research on hydrogen fuel blends in a walking beam reheating furnace. CIVS Senior Design students Zach Kaminsky, Imanol Mercado, and Zach Holmes won 1st place Engineering Senior Design award for their work in Simulating Thermal Stress in Slab Casting. [Read more...](#)



Student Success Story: Misbahuddin Syed



Congratulations to CIVS RA Misbahuddin Syed on receiving his MSME degree and starting a new job at a company in NW Indiana. At CIVS, his research focused on CFD simulation of reheat furnaces. This allowed him to blend rigorous academic knowledge with practical industrial applications and to learn problem-solving skills. He analyzed fluid flow, heat transfer, combustion, scale formation, and stresses within the furnaces to optimize their efficiency. He also explored induction heating to reduce CO2 emissions. *“Collaborating with a talented team, I gained insights into the intricacies of furnace operations and the significance of precise modeling. This invaluable experience has not only deepened my expertise but also opened up multiple job opportunities, positioning me well for a successful career in engineering and simulation technology.”* [Read more...](#)

Successful SMSVC April Semi-Annual Meeting



Approximately 80 industry collaborators and CIVS faculty, staff, and students met at CIVS for the SMSVC Semi-Annual Meeting on April 10-11. The events included 1) technical presentations by CIVS staff and students in 6 topics (safety, ironmaking, EAF, Continuous Casting, Ladle, and Reheating Furnace) 2) A Dinner Keynote 3) CIVS student poster competitions 4) Project Technical Committee meetings 5) the SMSVC board meeting. Active discussions were held throughout the two-day event, with excellent feedback on the project progress and outcomes as well as the quality of presentations. [Read more...](#)



SMSVC NOTES

Annual Meeting
November 6-7, 2024

If interested in becoming a member, please contact steelcons@pnw.edu, or visit steelconsortium.org.

SMSVC Keynote on Smart Use of Scrap and Other Alternatives in EAF Operation for Decarbonization

Mr. Barry Schneider, President and Chief Operating Officer of Steel Dynamics and President of AIST, delivered a keynote speech on “Smart Use of Scrap and other Alternatives in EAF Operation for Decarbonization” at the SMSVC annual dinner on April 10. The presentation highlighted Steel Dynamics’ history of sustainability efforts as well as an overview of its innovation for decarbonization in various plants and operations. [Read more...](#)



Stelco Representatives Productive Visit to CIVS

On July 24, CIVS welcomed SMSVC member company Stelco from Canada. Their visit included overview of CIVS & SMSVC latest developments, review of past and current collaborated projects, discussions on expansion of Stelco-PNW partnership, and a tour and hands-on demonstrations. [Read more...](#)



CVIS Students & Staff Visit NIPSCO Generating Station

CIVS students & staff visited NIPSCO’s Generating Station in Michigan City. The tour included the boiler, bag house, & FGD systems. NIPSCO is a long-time collaborator with PNW and CIVS. [Read more...](#)



Facts and Impacts

- \$40+ million savings for companies
- \$40+ million in external grants and contracts
- 180+ external organizations collaborated with CIVS
- 450+ projects
- 700+ national and local news
- 2,200+ students employed and mentored
- 11,600+ students used CIVS for virtual labs
- 200+ Purdue faculty and staff collaborators
- 320+ student awards and grants (globally since 2011)
- 43,000+ local, national, and international visitors