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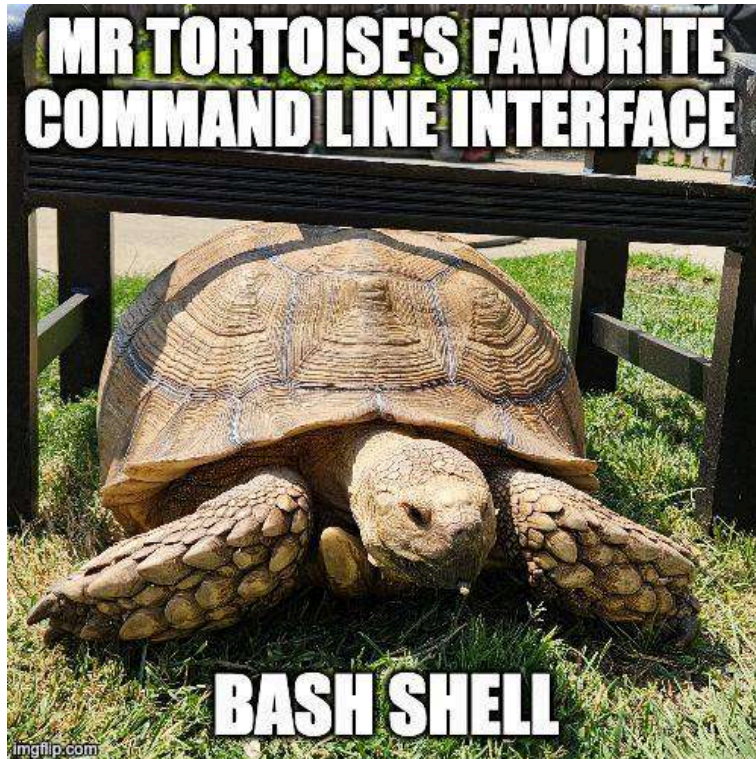
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**Meme of the Month!**

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## LATEST NEWS

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### **Register for the 2023 Fall Meeting in Cleveland**

We cordially invite you to attend our Fall MDS-Rely Center Meeting on Tuesday and Wednesday **September 12-13** in-person at Case Western Reserve University in Cleveland, OH. Attend faculty project pitches, a poster session, and network with Pltt and Case faculty and graduate students and other industrial and government lab members. Find more information about the Fall 2023 meeting [here](#).

**[Register Here!](#)**

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### **Request for Proposals due July 28th**

Attention faculty! In consultation with our Industry Advisory Board, the MDS-Rely team is streamlining our RFP process and will only require a one-page proposal summary and quad chart. The Industry Advisory Board (IAB) will review these materials, inviting select faculty to move to a full proposal ahead of the IAB Meeting in September. Please see [here](#) for documents. Our request for proposals is [here](#).

## OTHER NEWS

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### Congratulations to Dr. Paul Leu for Promotion

Co-Director Dr. Paul Leu will be promoted to full professor at the University of Pittsburgh, effective on September 1, 2023. Paul received his PhD from Stanford University and did a postdoctoral research fellowship at UC Berkeley before joining Pitt in 2010. Paul has been Co-Director of MDS-Rely since it started in July, 2021. He leads the Laboratory for Advanced Materials at Pittsburgh ([LAMP](#)).



## FACULTY-FEATURED PROJECT

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### **New Seed Project: Non-Invasive Detection of Defects during Coatings Manufacturing**

[Chris Wirth](#) | Associate Professor, Department of Chemical and Biomolecular Engineering | Case Western Reserve University



Professor Chris Wirth and his team are interested in expanding current inline measurements of chemical product properties to include functional material properties, such as turbidity, color and stability. They aim to “leverage imaging, automation, and complementary tools from the data science and machine learning community” to automate the detection of defects within the automotive coating industry. Their goal is to develop image processing workflows from data they have previously collected and design a high throughput spray system for data generation to hopefully deploy it within a real automotive coating environment. Professor Wirth’s team will be meeting every other week at 11:30 AM on Fridays (July 21, Aug 4,...) if you are interested in learning more.

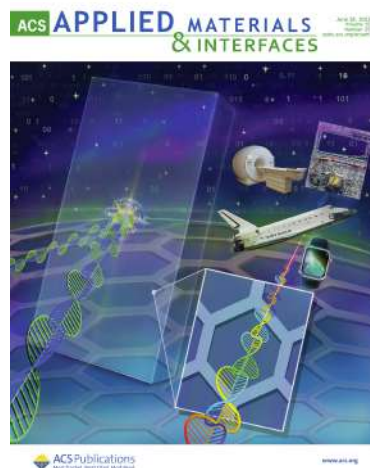
**[Read the full article here!](#)**

## CENTER PUBLICATIONS

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### EMI Shielding Project Cover Art

Congratulations to PhD student, Mingxuan Li, whose most recent paper, “Silver Meshes for Record-Performance Transparent Electromagnetic Interference Shielding” was featured on the June cover of ACS Applied Materials and Interfaces! If you are interested in reading more about this project, check out our associated [publications](#).



## UPCOMING EVENTS

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### Monthly Technical Seminar

#### “Advanced Materials and Manufacturing Research at NETL”

*Ömer Doğan | Technical Portfolio Lead for Advanced Materials Development at the National Energy Technology Laboratory's Research And Innovation Center*

**Date:** Thursday, July 20 4-5 PM

**Location:** \*virtual (zoom)

[Zoom Meeting Link Here](#)



**Abstract:** The Advanced Materials Development (AMD) Program at NETL aims at developing affordable, durable, cost-effective high-performance materials (HPMs) necessary for safe and reliable generation of power from hydrogen and enabling a bridge to net-zero carbon economy. Efforts within this portfolio focus on developing improved steels, superalloys, high-performance ceramics, and other advanced materials that resist degradation in hydrogen using an integrated computational materials engineering (ICME) approach that incorporates computational materials

design with best practice manufacturing (modified as needed to achieve microstructure and performance objectives) using focused mechanical testing and characterization for validation. Research efforts also focus on developing and validating computational algorithms for designing advanced materials and predicting alloy life performance in hydrogen- containing environments.

The AMD portfolio provides solutions to enable technologies for hydrogen production and utilization. Mitigating the detrimental effects of hydrogen on steels and weldments used in high-temperature hydrogen production processes, such as gasification and reforming, will ensure safe operation by preventing catastrophic failures. Development of improved environmental barrier coatings (EBCs) to protect ceramic matrix composite (CMC) components and nickel superalloys with improved temperature capability will allow hydrogen turbines to operate at higher temperatures with higher efficiency. Development and demonstration of improved manufacturing processes will facilitate production of advanced HPMs to enable above applications with improved service life performance. Use of computational materials models, multiscale characterization simulations of microstructural features, cutting-edge data analytics, and techno-economic and market studies will guide and accelerate materials design and manufacturing development needed to enable a net-zero carbon economy.

**Bio:** Dr. Ömer Doğan is a technical portfolio lead for advanced materials development program at National Energy Technology Laboratory's Research and Innovation Center. In this role, he oversees projects on high performance materials development targeting hydrogen production, transport, and utilization to facilitate the transition to net-zero carbon economy. His areas of expertise include degradation of materials in extreme environments and microstructure-property-performance relationships. Dr. Doğan holds a Ph.D. and M.S. in Materials Science and Engineering from Case Western Reserve University and a B.S. in Metallurgical Engineering from Istanbul Technical University. He has over 100 publications in materials science and engineering.

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## **Biweekly Project Meetings Available To All Members**

If you are interested in attending any biweekly project meeting, please visit our Members portal, which can be accessed via the link at the top right of our Center website. You can also go to a specific project and raise a request to get access to the Zoom links to attend any of these meetings. You can also access prior recordings and presentations of any biweekly meetings.

### **1. netSEM Modeling for Service Life Prediction of Polymers**

*Prof. Laura Bruckman*

July 11, 25... Tuesdays 1 - 1:30 PM

### **2. Achieving Reliable Laser Powder Bed Fusion based Additive Manufacturing via Machine Learning of in-situ Optical Profilometry Monitoring Data**

*Prof. Xiayun Zhao*

July 14, 28... Fridays 4:15 - 4:45 PM

### **3. Image Machine Learning of Printed Metal Films for EMI Shielding**

*Profs. Leu, Iyengar*

July 19, August 2 ...Wednesdays 1:30 - 2 PM

### **4. Comparative analysis of Machine Learning techniques in predicting structure property relationships for composite dielectric materials**

*Profs. Sehirlioglu, Martin*

July 17, 31 ...Mondays 1:00 - 1:30 PM

### **5. Effects of Aerosol Jet Printing Parameters on the Lifetime Performance of Additively-Manufactured Flexible Circuits**

*Prof. Janut Gbur*

July 21, August 4...Fridays 1:00-1:30 PM

### **6. Non-Invasive Detection of Defects during Coatings Manufacturing**

*Prof. Chris Wirth*

July 21, August 4...Fridays 11:30-12:00 PM

## **JOB OPENINGS AND OPPORTUNITIES**

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### **Fall 2023 Senior Capstone Project Opportunities**

Are you a member interested in getting matched to highly talented undergraduate students to deliver early-stage prototypes that help solve your issues. We are creating senior design projects for this Fall now. Feel free to contact Dr. Paul Leu ([pleu@pitt.edu](mailto:pleu@pitt.edu)) or Dr. Laura Bruckman ([lsh41@case.edu](mailto:lsh41@case.edu)) if you are interested.

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### **NNL Fellowship Opportunities**

#### **The Admiral Hyman Rickover Graduate Fellowship Program**

**Description:** This program in Nuclear Engineering prepares graduate students for roles in the Naval Nuclear Propulsion Program as it supports the broader objective of advancing fission energy development through the research efforts of Fellows.

#### **Department of Energy Computational Science Graduate Fellowship Program**

**Description:** Computational Science Graduate Fellows are given opportunities to develop improved algorithms for parallel computer architectures, advanced

visualization, advanced data management, etc, etc. You could be involved in new developments within several broad categories, including but not limited to reactor physics, materials science (including semiconductor applications), two-phase flow, and radiation shielding.

Learn more about both opportunities [here](#). Feel free to contact the Fellowship Coordinator Dr. Jake Ballard ([jake.ballard@unnpp.gov](mailto:jake.ballard@unnpp.gov)) with any questions.

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## **NNL Internship and Co-op Opportunities**

NNL has begun posting their available internships and co-ops for 2024.

\***Co-op** positions include: Electric/Computer Engineering, Mechanical Engineering, Software Engineering, and Thermal Hydraulic Modeling Engineering.

\***Internship** positions include: Business (IT), Chemistry/Chemical Engineering, Compliance Engineering, Cybersecurity, and Data Science.

Click [here](#) for more information on each position.

### **Submit News**

[Fill out a news form here!](#)

### **Submit Job Openings**

\*For MDS-Rely members only

[Fill out a job opening form here!](#)

## **Interested in partnering with Case Western or Pitt Professors?**

Please contact [Dr. Laura Bruckman](#) or [Dr. Paul Leu](#) for more information!

## **CONNECT WITH US!**



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### **Our mailing address is:**

Case Western Reserve University  
White Building, Room 538  
10900 Euclid Avenue  
Cleveland, OH 44106

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