

SUMMER 2022

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UNIVERSITY
OF WYOMING

School of
Energy Resources

QUARTERLY NEWSLETTER

Vol. 3, Issue 2



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MESSAGE FROM THE EXECUTIVE DIRECTOR

To the SER community,

As we advance to mid-year, and the start of a new fiscal year, the School of Energy Resources is expanding our team to ensure we are able to best serve the state in our mission of energy-driven economic development for Wyoming - these opportunities span many energy resources and opportunities for our energy communities and workers.

In addition to graduating six students from the Energy Resource Management and Development (ERMD) degree program with a 100% employment rate at graduation, the SER academic program recently launched an innovative 3+3 Quickstart Program with the UW College of Law. The 3+3 Quickstart allows UW students to earn an ERMD bachelor's degree and a law degree through the College of Law in six years instead of the traditional seven. In addition to being a recruitment tool for SER's undergraduate degree, we expect that the 3+3 program will help retain talented aspiring energy attorneys in the state.

On the research side, the Carbon Engineering Initiative has overseen the completion of the coal-derived char brick house construction, and researchers are now collecting data from both the char brick house and the conventional brick house for performance comparison purposes. For their efforts in developing a dry methane reforming catalyst, researchers in the Center for Carbon Capture and Conversion were awarded time on the Advanced Photon Source at Argonne National Laboratory. The use of the specialized equipment will help to advance the technology, bringing it one step closer towards commercialization.

In the Center for Economic Geology Research, researchers completed a cross well tomography analysis as part of the detailed site characterization for Phase III of the Wyoming CarbonSAFE project and are poised to begin additional fluid testing later this summer. Meanwhile, the CORE-CM projects, focused on building a Wyoming rare earth element and critical mineral industry, are bringing together industry and project stakeholders for Annual Forums in the early fall.

While there have been other significant advances in research activities within SER, the main focus this quarter has been on building our incredible team. SER looks to the future as potential new opportunities come into clearer view and we can and must be ready. To address those prospects and to support the already-expanding research activities, we have added several talented individuals that will help position SER for success in the future.

Sincerely,

Holly Krutka
Holly Krutka, Ph.D.



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ACADEMICS

UW School of Energy Resources, College of Law Launch 3+3 Accelerated Degree Program

The University of Wyoming School of Energy Resources (SER) has launched an accelerated degree program in collaboration with the College of Law.

The Quickstart 3+3 program allows UW students to earn a bachelor's degree in energy resource management and development (ERMD) through SER and a law degree through the College of Law. Students can now gain the combined professional credentials in six years instead of the traditional seven.

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UW School of Energy Resources Student Presents at Air Sensors International Conference

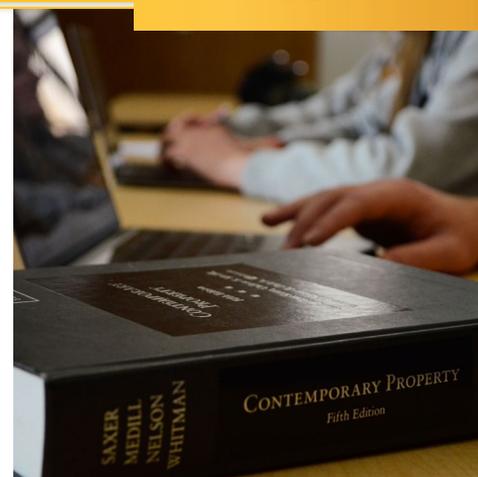
Austin Moon, a University of Wyoming School of Energy Resources student, presented a paper co-written with **Robert Field**, UW atmospheric science associate research professor, at the recent Air Sensors International Conference (ASIC) in Pasadena, Calif.

Hosted by the University of California-Davis, the conference featured various stakeholders to promote and advance air pollution sensors, and to foster community involvement in monitoring air quality.

Since 2018, SER's "Air Quality Management" course and 2B Technologies have collaborated with the AQTreks personal air monitor (PAM). The PAM includes multiple sensors that enable the rapid measurement of air pollutants, including carbon monoxide, particulates and carbon dioxide.

Moon, an SER senior from Cheyenne, is earning his bachelor's degree in energy resource management and development, with a concentration in energy and environmental systems. He was selected from among his peers in the course using the PAM equipment to support his work through further collaborative research with Field.

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» Austin Moon

Academics Highlights



- Six students in the Energy Resource Management and Development (ERMD) degree at the School of Energy Resources graduated in the spring ceremony. Graduates from left to right are **Isaac Boettcher**, **Emily Lantiegne**, **Juliana Santarelli**, **Caleb Bowen**, **Caleb Durgin**, and **Hunter Lee**. [READ MORE >](#)

- SER Professor of Law **Tara Righetti** penned an article for the *Wyoming Lawyer*, the Wyoming State Bar Association's bimonthly publication. The article examines CCUS and hydrogen playing a major role in the energy future. [READ MORE >](#)

- SER Professor of Geology & Geophysics and Wyoming Excellence Chair **Dario Grana** was the recipient of the 2022 Outstanding Educator Award by the Society of Exploration Geophysicists (SEG).



RESEARCH

Center for Economic Geology Research (CEGR)

Researchers Complete Cross Well Tomography at Wyoming CarbonSAFE Site

Researchers in the School of Energy Resources Center for Economic Geology Research completed a cross well tomography analysis as part of the detailed site characterizing for Phase III of the Wyoming CarbonSAFE project.

Led by CEGR Senior Research Scientist **Zunsheng John Jiao**, the imaging between the two wells adjacent to Basin Electric Power Cooperative's Dry Fork Station was achieved through a seismic survey that was completed on June 10.

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School of Energy Resources Represented at 2022 Annual PCOR Meeting in Anchorage

Members of the UW School of Energy Resources attended the 2022 Annual Plains CO₂ Reduction (PCOR) Partnership meeting in Anchorage, Alaska. SER research scientists **Erin Phillips** and **Selena Gerace**, who serve as the SER leads in the partnership, attended the meeting alongside Senior Director of Research, **Scott Quillinan**, Director of Outreach, **Christine Reed**, and SER's Executive Director, **Holly Krutka**, who presented at the meeting.

Led by the Energy & Environmental Research Center (EERC) at the University of North Dakota, the PCOR Partnership Initiative is one of four projects competitively awarded by the U.S. Department of Energy (DOE) National Energy Technology Laboratory under the Regional Initiative to accelerate carbon capture, utilization, and storage (CCUS).

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Center for Energy Regulation & Policy Analysis (CERPA)

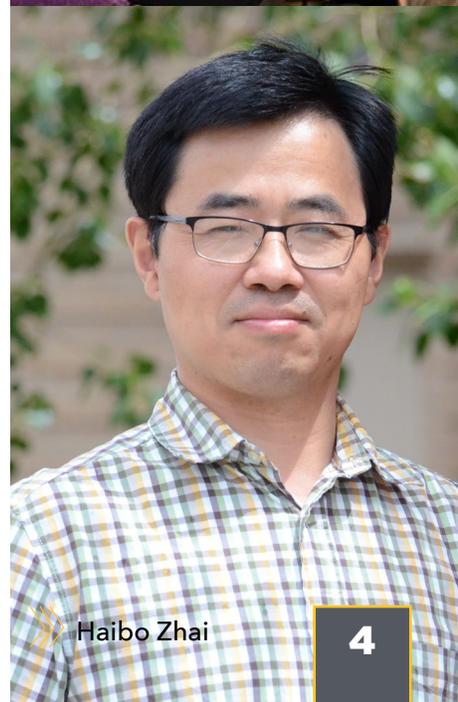
UW Study Examines Economic Incentives for Deploying Carbon Capture, Sequestration in Wyoming

University of Wyoming researchers recently published a policy analysis article in a leading environmental research journal that examines the potential role of economic and policy incentives to facilitate carbon capture and storage (CCS) deployment in the state.

Haibo Zhai, the Roy and Caryl Cline Chair of Engineering, Environment and Natural Resources and an associate professor in the UW College of Engineering and Applied Science, led the study. The research, titled "Policy-Driven Potential for Deploying Carbon Capture and Sequestration in a Fossil-Rich Power Sector," was published in the peer-reviewed journal *Environmental Science & Technology*. The journal is a highly cited publication for world-class environmental research across a broad and diverse range of environmentally relevant topics. [READ MORE >](#)



Holly Krutka Presents at PCOR



Haibo Zhai

Center for Carbon Capture and Conversion (CCCC)

UW Researchers Receive Advanced Photon Source Use Award from Argonne National Laboratory

University of Wyoming researchers recently won an award to use the Advanced Photon Source (APS) – a high-energy X-ray light source facility – at the Argonne National Laboratory in Lemont, Ill.

The project is led by chemistry Professor **Jing Zhou** and chemical engineering adjunct Professor **Joseph Holles**. The research team is working to achieve in-situ X-ray diffraction (XRD) measurements on a novel catalyst which is able to convert carbon dioxide mixed with methane into a valuable synthesis gas using a dry-reforming process. UW doctoral student **Qian Yang**, of Laramie, has been working to develop an anchor solution for the catalyst as part of his dissertation research.

[READ MORE >](#)

Center for Hydrogen Energy Research Center (H₂ERC)

UW School of Energy Resources Seeks Proposals Across Hydrogen Energy Supply Chain

The University of Wyoming School of Energy Resources (SER) is seeking proposals from current UW faculty members on hydrogen energy. Topics of interest for the proposals include all levels of the supply chain, such as hydrogen production, use, transportation and storage.

The opportunity will fund projects up to 15 months in duration and with a maximum budget of \$100,000.

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Other Research Activities

UW to Receive \$800,000 From Department of Energy for Nuclear Environmental Justice Project

A University of Wyoming proposal has been selected to receive an \$800,000 research award from the U.S. Department of Energy's (DOE) Nuclear Energy University Program (NEUP).

The agency announced that it was awarding more than \$61 million for 74 nuclear energy projects across 40 U.S. universities to support nuclear technology development, infrastructure improvements and career opportunities.

The UW proposal, led by Assistant Professor **Rachael Budowle** in the Haub School of Environment and Natural Resources, will focus on applied community-based environmental justice research with community members, environmental organizations, developers and other stakeholders in Wyoming.

In addition to the UW-led proposal, **Tara Righetti** and **Temple Stoellinger** are part of a second University of Wisconsin-Madison-led collaborative study. That project will provide a comprehensive assessment of the challenges and opportunities of open architecture for advanced reactors and examine its potential to reduce the costs of those reactors. [READ MORE >](#)



9H Research Foundation Energy Competition Winners Announced at UW

Rami Alloush, of Damanhour, Egypt, took top honors in the recent \$4,000 9H Research Foundation energy competition at the University of Wyoming School of Energy Resources.

Alloush, a doctoral student of petroleum engineering in UW's Center of Innovation for Flow through Porous Media (COIFPM), received \$2,000 for his detailed examination of the hydrogen production options available to Wyoming.

The energy competition challenged UW students to present a technoeconomic analysis of different routes for hydrogen production in Wyoming and was launched in collaboration with UW's School of Energy Resources (SER).

READ MORE >



SER Ex. Dir. Holly Krutka and Gene Humphrey from 9H Research Foundation award prize to Rami Alloush

Winning teams of the Baker Hughes 'Decarbonization Prize'

UW Student Winners Selected in 'Decarbonization Prize' Contest

Winners of the Decarbonization Prize contest were selected from among diverse proposals submitted by University of Wyoming students.

Sponsored by the UW School of Energy Resources (SER), the Wyoming Energy Authority and Baker Hughes, the goal of the competition is to advance energy solutions through innovative applications for existing products and services, or to introduce new concepts that will drive decarbonization.

UW Ph.D. candidates **Rami Alloush**, of Damanhour, Egypt, and **Moustafa Aly**, from Suez, Egypt, were selected as the first prize recipients for their proposal titled "A Self-Sustained Municipal Water Treatment Plant Utilizing the Baker Hughes NovalTTM Hybrid Turbine and Semi-Artificial Photosynthesis."

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Research Highlights

- The University of Wyoming's **Enhanced Oil Recovery Institute (EORI)** sponsored an evaluation of a novel product that reportedly could help reduce the detrimental effects of paraffin precipitation and deposition in oil wells. This novel product is produced from recycled tires and is under development by a clean-tech company that converts scrap rubber materials into several beneficial products. **DOWNLOAD HERE >**

- Members of the SER research team traveled to Houston, Tex. for the American Association of Petroleum Geologists (AAPG) Carbon Capture, Utilization, and Storage (CCUS) conference March 29-31. Among the presenters at the conference was one of the unsung heroes of the CEGR, **Matt Johnson**. **READ MORE >**
- Construction of the char brick demonstration house in the CCCC was completed on June 1, and performance monitoring has commenced.



NEW FACES AND POSITIONS



Lon Whitman

Director, EORI

Lon Whitman was appointed as the Director of the Enhanced Oil Recovery Institute after 15 years of service with EORI. In his new role he will provide a unified

vision for the Enhanced Oil Recovery Institute to help increase production through improved and enhanced oil recovery operations. [READ MORE >](#)



Trina Pfeiffer

Interim Director, CCCC

Trina Pfeiffer is serving as the interim director for the Center for Carbon Capture and Conversion. Pfeiffer has previously worked with SER in a consulting capacity for the last four years, and will continue

to provide process engineering and modeling support to the ongoing research in the CCCC, while managing the Center. [READ MORE >](#)



Grant Copeland

Research Scientist, CEGR

Grant Copeland joined SER in the Center for Economic Geology Research. A master's graduate from the Kaszuba Lab in the UW Dept. of Geology & Geophysics, Copeland will

primarily be working on the PCOR project and the CORE-CM (Carbon Ore, Rare Earth and Critical Minerals) projects. [READ MORE >](#)



ChooiKim Lau

Research Scientist, CCCC

ChooiKim Lau joined SER in the Center for Carbon Capture and Conversion. Lau recently graduated with a master's degree in Architectural Engineering from UW. During her graduate program, Lau

was the lead student on the coal-derived building materials developed in the CCCC and managed the construction of the char brick demonstration house on campus. [READ MORE >](#)



Tiffany Bishop

Project Specialist, SER

Tiffany Bishop joined SER as a project specialist. Bishop previously worked in the UW Technology Transfer Office and has a robust background in intellectual property and

patent prosecution. In her new role, Bishop will be working with the directors of the research Centers of Excellence as well as project principal investigators (PI's) to assist with the administrative obligations associated with major grants.

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Frankie Vogt

Business Manager, SER

Frankie Vogt joined SER as the new business manager. Vogt was hired to meet the growing needs of the rapidly expanding research endeavors at SER. In his new position, Vogt

will predominantly be working on state-funded projects as well as special appropriations. He will manage multiple accounts for the research Centers of Excellence, and in particular, will work directly with the newly launched Hydrogen Energy Research Center (H₂ERC). [READ MORE >](#)

OUTREACH

School of Energy Resources Welcomes Two New Members to Energy Resources Council

The School of Energy Resources (SER) is pleased to welcome Representative **Don Burkhart** of the Wyoming Legislature and **Chad Teply**, the Senior Vice President of Project Execution for Williams as the newest board members to the Energy Resources Council (ERC).

Appointed by **Governor Mark Gordon** and confirmed by the Wyoming Senate, Burkhart and Teply replace the seats formerly held by Representative **Mike Greear** and **Tom Botts**, a retired Executive Vice President for Royal Dutch Shell.

The ERC was established by Wyoming statute 21-17-117(e) to guide SER in setting priorities for energy-related academics, research, and outreach. The thirteen-member board consists of leaders from industry, the legislature and UW, and is tasked with providing direction for responsive, internationally recognized, interdisciplinary energy-related programs that are integral constituents of the university's identity.

READ MORE >



Rep. Don Burkhart



Chad Teply

Peabody Visits UW School of Energy Resources

Representatives from Peabody visited the University of Wyoming School of Energy Resources. The visit comprised of members from the company's leadership team, including Peabody President and Chief Executive Officer, **Jim Grech**; **Marc Hathhorn**, President of U.S. Operations; **Darren Yeates**, Executive Vice President and Chief Operating Officer, **Scott Jarboe**, Chief Administrative Officer and Corporate Secretary, among others.

During the trip, the group learned about the innovative projects being conducted by SER - with partners in the College of Engineering and Applied Science and the College of Agricultural and Natural Resources - to drive new economic opportunities for energy development. Projects of note are SER's leading research in the area of carbon capture, utilization, and storage (CCUS), new prospects in hydrogen production, and most especially the carbon engineering efforts using Powder River Basin coal to make high-volume commodity products such as coal-derived building materials, asphalt and paving materials, and soil amendments. **READ MORE >**



Outreach Highlights

- Members of the School of Energy Resources traveled to Gillette for the ribbon cutting ceremony on the recently completed Wyoming Innovation Center (WylC). SER Executive Director **Holly Krutka** was among the speakers at the event, celebrating the opportunities for Wyoming coal that WylC brings. **READ MORE >**

- Registration for the **CORE-CM Annual Forum in the Powder River Basin** is officially open!! The in-person forum seeks to bring together industry professionals and stakeholders to provide project updates and an opportunity for robust discussions to advance the project. **REGISTER NOW >**



- Please stay up to date on our upcoming events by checking the **EVENTS CALENDAR >**



WYOMING'S ENERGY FUTURE

Sponsored by the UW School of Energy Resources and the Wold Foundation



Please join the School of Energy Resources and the Wold Foundation for a day long conference examining the future of energy in Wyoming.

Thursday, September 15, 2022
UW Conference Center | Laramie, WY
Registration Opens Soon!



SAVE THE DATE



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