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IN THIS ISSUE:

Peabody and PureWest Make Major Contributions to Support Energy Research

Professor Tara Righetti Appointed to White House Council on Environmental Quality Task Force

ERMD Student Jacob Schneider Works with Williams to Advance Hydrogen Feasibility

UW Receives DOE Funding for HERO Basalt CarbonSAFE Project in Pacific Northwest

RENEW Academic Workshop Hosted at UW to Build Capacity in Nuclear-Related Research

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School of Energy Resources

QUARTERLY NEWSLETTER Vol. 4, Issue 1

ACADEMICS



OUTREACH



MESSAGE FROM THE EXECUTIVE DIRECTOR

To the SER community,

The year is off to an exciting start with many new projects, encouraging advancements on existing work, and incredible support from industry partners.

First and foremost, SER is grateful for the substantial philanthropic gifts from PureWest and Peabody. These gifts will continue to drive innovative technologies that will positively impact SER and our ability to serve the state of Wyoming and its energy sector.

Additionally, SER has seen significant growth in the research centers of excellence, and in particular in the Nuclear Energy Research Center. Under the leadership of co-Directors Tara Righetti and Caleb HIII, interest in nuclear-related research has grown substantially on campus. The duo successfully hosted the "Research Explorations for Nuclear Energy in Wyoming" Academic Workshop, which brought experts from all over the country to share insights with Wyoming researchers and industry professionals, increasing the capacity for nuclear, and forging connections with potential collaborators.

In addition, SER's other centers of excellence are also thriving. The Center for Economic Geology Research was awarded a second CarbonSAFE project to study carbon dioxide mineralization in Orgeon, with the carbon dioxide being generated by Wyoming natural gas. The Center for Carbon Capture and Conversion continues to advance the field demonstration of its coal refining technology.

SER's academic team continues to ensure that University of Wyoming graduates will be prepared for careers in the energy sector. New certificates in land administration and carbon capture, use and storage will welcome students starting in the fall semester.

As the seasons progress, we look forward to getting out into the Wyoming communities to share more about our efforts!

Sincerely,

Holly Kritka Holly Kritka, Ph.D.



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UW Student Works to Advance Hydrogen Feasibility With SER and **Williams**

A feasibility study led by energy infrastructure company Williams - in conjunction with the University of Wyoming's School of Energy Resources - is advancing with the help of a UW undergraduate student.

In 2021, Williams received a nearly \$1 million grant from the Wyoming Energy Authority (WEA) to complete a feasibility study to evaluate water access, compatibility and asset integrity in support of green or blue hydrogen. Additionally, Williams pledged \$500,000 over five years to support a new center at SER dedicated to applied hydrogen research and to grow a hydrogen industry in Wyoming.

As part of the study, UW student Jacob Schneider, of Cincinnati, Ohio, created a modeling story map to help Williams identify the best site for the possible location of a hydrogen electrolysis plant.



A senior in SER's Energy Resource Management and Development (ERMD)

program, Schneider is pursuing a degree with a concentration in Professional Land Management, which focuses on learning about property law and ownership, land use, energy development, siting, permitting and leasing.

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Four School of Energy Resources Seniors Represent UW at 2023 NAPE Annual Summit

The School of Energy Resources sent four graduating seniors to the 2023 North American Petroleum Expo (NAPE) Annual Summit event in Houston, Tex.

Founded in 1993 by the American Association of Professional Landmen (AAPL), NAPE is an organization to benefit the energy industry at large through programs such as education, legislative and regulatory advocacy, technical publications, public lands access efforts, scholarships and more.

Kieran McMullen and Eli Vigil, both of Castle Pines, Colo., along with Dayton Reese of Brighton, Colo., and Montgomery Hughes of Claremore, Okla., represented the University of Wyoming at the event. All majoring in Energy Resource Management and Development at SER, the guartet of students have all pursued the Professional Land Management concentration within the program.

The SER students also had the opportunity to visit with **Gov. Mark Gordon** as well as his Chief Energy Advisor, Randall Luthi at the event.

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ACADEMICS

SER's Koski Recognized as 'Top Prof' by UW Mortar Board Chapter

Kris Koski of the School of Energy Resources was named among the 'Top Profs' by the Mortar Board Chapter at the University of Wyoming. Koski is an Associate Lecturer and the director of the Professional Landman Program at SFR.

Mortar Board is the premier national honor society recognizing college seniors for outstanding achievement in scholarship, leadership and service. Mortar Board provides opportunities for continued leadership development; promotes service to colleges and universities; and encourages lifelong contributions to the global community.

Chartered in 1933, the UW Cap and Gown Chapter of Mortar Board members participate in many projects and activities throughout the year, both on the UW campus and in the Laramie community.

'Top Prof' is a student driven selection process in which members of the Cap and Gown Chapter of Mortar Board select professors who have positively influenced their lives at UW. These professors go beyond normal classroom expectations to help their students succeed.

Nominated by Energy Resource Management and Development senior and Mortar Board chapter member Molly Murnane of Crofton, Md., Koski was honored among other 'Top Profs' at the annual recognition dinner.

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UW's Righetti Selected to Serve on White House Council on **Environmental Quality Task Force**

SER Professor of Law and Occidental Chair in Energy and Environmental Policies Tara Righetti, was among seven public figures and energy experts in the state of Wyoming selected to serve on the White House Council on Environmental Quality (CEQ) Task Forces. Righetti will serve as a member of the "Carbon Dioxide Capture, Utilization, and Sequestration (CCUS) Federal Lands and Outer Continental Shelf Permitting Task Force." In her capacity, she will provide recommendations to the federal government on how to ensure that CCUS projects, including carbon dioxide pipelines, are permitted in an efficient manner, reflect the input and needs of a wide range of stakeholders, and deliver benefits rather than harms to local communities.

Righetti is a recognized leader for her contributions to the field of CCUS policy and governance, both domestically and abroad.

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Academics Highlights

Associate Professor of Civil and Architectural • Engineering and SER adjunct professor Kam Ng received one of the inaugural Provost Term Professorships. Dr. Ng serves as a P.I. on multiple SER grants. **READ MORE >**



SER Academic Director Kami Danaei, Ed.D. received a Mortar Board "Tip of the Hat' Award. Danaei was nominated by **Energy Resources** Management and



Development student Molly Murnane.





RESEARCH

Wind Energy Research Center

UW Researchers Use Wind Farm Site Field Data to Test Supercomputer Modeling

A collaboration between University of Wyoming researchers and a wind energy company has provided new insights into the use of high-performance computing to predict wind resources.

A team led by **Michael Stoellinger**, an associate professor in UW's Department of Mechanical and Energy Systems Engineering and codirector of the Wind Energy Research Center, compared sophisticated computer simulations of wind flow with data recorded at the Power Company of Wyoming's Sierra Madre wind farm site near Rawlins. The research was selected as a featured article in the *Journal of Renewable and Sustainable Energy*.



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Center for Energy Regulation and Policy Analysis

UW's SER Updates Survey on Wyoming Residents' Acceptance for Energy Development

An updated survey from the University of Wyoming's School of Energy Resources explores Wyoming residents' perspectives of energy development, including "social license" – the level in which Cowboy State residents support or oppose different forms and amounts of energy development.

The research is a companion document to the original study that was conducted in 2020 in collaboration with UW's Ruckelshaus Institute of Environment and Natural Resources.

The study provides a summary of Wyoming residents' values and beliefs related to energy in Wyoming. The research was led by **Jessica Western**, an adjunct professor in the UW Haub School of Environment and Natural Resources, and **Selena Gerace**, an SER associate research scientist. It was supported by the Plains CO₂ Reduction Initiative and the U.S. Department of Energy's Intermountain West Energy Sustainability and Transitions initiative.

A full analysis of the data will be forthcoming.

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Hydrogen Energy Research Center

School of Energy Resources Welcomes Energy Economist to Hydrogen Energy Research Center

The Hydrogen Energy Research Center (H₂ERC) welcome **Dayana Zhappassova** to the research team as an energy economist.

Originally from Karaganda, Kazakhstan, Zhappassova earned her Bachelor's degree in Finance and her Master's in Economics from the University of Wyoming. In addition to her new role in H₂ERC, she is concurrently working on her Ph.D. in Economics at UW.



Zhappassova brings with her an abundance of knowledge and training in analyzing emerging markets, and has cultivated an area of specialization in economic rationale and decision making. She will be applying her expertise on the carbon capture and net-zero efforts being led in the Center, with the first area of focus being on water-related issues.

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Nuclear Energy Research Center

Nuclear Energy Research Center Releases White Paper Series

The Nuclear Energy Research Center (NERC) at the UW School of Energy Resources has released five white papers on nuclear-related topics relevant to Wyoming.

The objective of the NERC white paper series is to share preliminary research conducted on nuclear-related energy issues in the state as they emerge to serve as a timely and relevant public resource.

These projects were supported with program development funds as part of the Emerging Market Analysis (EMA) initiative led by Idaho National Lab (INL). The collaborative effort includes researchers from INL, University of Michigan, University of Alaska, MIT, and Boise State University.

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UW SER Researchers Produce Report on Nuclear Microreactor Applications

In a collaborative project with nuclear energy and regulatory experts across the U.S., University of Wyoming School of Energy Resources research staff and faculty members co-wrote a report outlining potential markets and evaluating state-level legal, regulatory, economic and technology implications for nuclear microreactor applications in U.S. markets.

The report, titled "Microreactor Applications in U.S. Markets, Evaluation of State-Level Legal, Regulatory, Economic and Technology Implications," was published through the U.S. Department of Energy Office of Science and Technical Information (OSTI).

The initial focus is on the Alaska and Wyoming energy markets serving location-specific energy needs for electricity and heat. A state-by-state evaluation of current carbon-related policies and nuclear policies was conducted to assess broader market applicability in states undergoing energy transformations.

The paper was written in part by **Eugene Holubnyak**, SER's Hydrogen Energy Research Center director; **Selena Gerace**, a research scientist in both the Center for Energy Regulation and Policy Analysis and the Center for Economic Geology Research; and **Tara Righetti**, the Occidental Chair in Energy and Environmental Policies and a College of Law professor.

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School of Energy Resources Announces Proposal Winners for Nuclear-Related Research at UW

The University of Wyoming's School of Energy Resources has selected three proposed research projects to receive funding for nuclear-related research at UW.

Recognizing that uranium production and nuclear energy are an important component of Wyoming's energy past, present and future, SER is actively encouraging UW researchers to pursue projects under these topics to continue growth on the topic – and to prepare for a possible resurgence in the uranium economy.

The three researcher chosen to receive seed funding under the request for proposals were:

- Charlie Zhang, assistant professor in civil and architectural engineering,
- **Caleb Hill**, the J.E. Warren Chair and an associate professor of chemistry, and co-Director of the Nuclear Energy Research Center (NERC)

 Bradley Carr, an associate research scientist in the Department of Geology and Geophysics and the director of the UW Near-Surface Geophysics Instrument Center.

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RESEARCH

Center for Economic Geology Research

UW Receives DOE Funding for HERO Basalt CarbonSAFE Project in Pacific Northwest

The University of Wyoming will receive \$10.5 million from the U.S. Department of Energy (DOE) for a research and development project advancing the wide-scale deployment of carbon management technologies to reduce carbon dioxide (CO_2) pollution.

Researchers in the UW School of Energy Resources Center for Economic Geology Research (CEGR) will lead the HERO Basalt CarbonSAFE (Hermiston Oregon Carbon Storage Assurance Facility Enterprise) project in partnership with Oxy Low Carbon Ventures (Oxy), Pacific Northwest National Laboratory (PNNL) and Calpine to accelerate the scale-up and deployment of commercial CO₂ storage in basaltic rocks at a storage complex near Hermiston, Ore.



The project is one of 11 that DOE is funding under Phase II-Storage

Complex Feasibility of the CarbonSAFE Initiative, which focuses on developing geologic storage sites with the potential to cumulatively store 50 million or more metric tons of CO₂, and is one of 33 projects benefiting from DOE's recently announced \$131 million investment into carbon management solutions.

The Pacific Northwest is a key market for Wyoming-sourced natural gas. The Northwest Pipeline that connects Wyoming natural gas resources to Washington and Oregon has over 14 million dekatherms of capacity.

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SER's Ying Yu Published Article on Wettability Variation and its Impact on CO_2 Storage Capacity as Part of the Wyoming CarbonSAFE Project

UW School of Energy Resources Research Scientist **Ying Yu** in the Center for Economic Geology Research recently published an article in *Fuel*, a prominent research and technology journal and leading source for fuel science.

The article entitled, "Wettability variation and its impact on carbon dioxide (CO_2) storage capacity at the Wyoming CarbonSAFE storage hub: An experimental approach," examines the wettability behavior in selected target storage formations to determine if it would affect the formation's CO_2 storage capacity.

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Research Highlights

 Research Scientist Charles Nye in the Center for Economic Geology Research was a featured speaker at the Collaboration in Natural Resources in Wyoming and the West Symposium in Thermopolis, Wyo.



 The University of Wyoming School of Energy Resources, together with the Wyoming Business Council (WBC), submitted a proposal for the U.S. Department of Energy's Four Regional Clean Direct Air Capture Hubs program, part of the Investment in Infrastructure and Jobs Act.

OUTREACH

UW's Nation Laboratory Day Features Multiple SER Speakers and Research Projects

Researchers in the School of Energy Resources (SER) led multiple breakout sessions featured on the agenda of UW National Lab Day that was co-hosted with the U.S. Department of Energy (DOE). The event was created for participants to learn about and explore opportunities for partnerships with DOE national laboratories.

SER actively partners with national laboratories across the country to advance multiple research projects, boasting successful collaborations with the Idaho National Laboratory (INL), the Pacific Northwest National Laboratory (PNNL), the National Energy Technology Laboratory (NETL), Los Alamos National Laboratory (LANL) and the National Renewable Energy Laboratory (NRTL) among others.

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UW SER Hosts Academic Workshop to Promote Nuclear-Related Research Opportunities

The Nuclear Energy Research Center (NERC) in the University of Wyoming's School of Energy Resources hosted the "Research Explorations for Nuclear Energy in Wyoming" (RENEW) academic workshop in April.

Led by NERC co-Directors **Tara Righetti** and **Caleb Hill**, the event brought together experts in advanced nuclear energy topics from federal agencies, national labs and higher education institutions with the aim of facilitating discussions on emerging research needs, partnership opportunities, challenges and best practices in nuclear research, and resources available to researchers.

The collaborative forum featured renowned experts and leaders in the nuclear field, including **Kathryn Huff**, assistant secretary for the Office of Nuclear Energy in the U.S. Department of Energy; **John Wagner**, director of Idaho National Laboratory; Commissioner **Annie Caputo**, of the U.S. Nuclear Regulatory Commission; and **Raymond Furstenau**, director of the Office of Nuclear Regulatory Research at the U.S. Nuclear Regulatory Commission.

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UW Doctoral Student Wins Energy Vault Student Competition

University of Wyoming doctoral student **Rami Alloush**, of Damanhour, Egypt, was named the winner of the Energy Vault Student Competition hosted by the UW School of Energy Resources.

Sponsored by Energy Vault, the student competition was designed to identify potential new methods of hydrogen storage and to provide examples of current research or companies exploring such methods. Energy Vault is a leading energy storage technologies company with solutions for short, long and extra-long duration.



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Outreach Highlights

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



 The School of Energy Resources completed the spring 2023 Distinguished Speaker Series. Events included presentations highlighting patent law and intellectual property, utilities, energy economics, international net-zero efforts, and hydrogen initiatives by the Department of Energy. Recordings of the presentations can be found on the SER YouTube page. WATCH HERE >

DEVELOPMENT

Peabody Gift to UW School of Energy Resources Supports Long-Term Energy Innovation

A \$500,000 gift by Peabody, a leading coal producer, to the University of Wyoming School of Energy Resources will support innovation in the field of carbon engineering and carbon management. In addition to the initial gift, Peabody has made a sustaining commitment of 1 cent per ton of Wyoming coal sold by Peabody to support these efforts.

The gift will create the *Peabody Education, Innovation and Technology Fund* to support SER's pioneering solutions in carbon engineering, management, capture, utilization and storage, as well as reclamation, alternative coal uses, regulatory analysis and policy, and more. These technologies are important to reduce carbon emissions while also meeting the world's energy needs.



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PureWest Energy Gift to UW School of Energy Resources Advances Natural Gas Research

A \$250,000 gift from PureWest Energy LLC to the University of Wyoming School of Energy Resources will support Wyoming natural gas research.

The contribution will establish the *PureWest Energy Natural Gas Research Fund* to support research conducted by SER faculty, staff and students that is focused on Wyoming's natural gas – methane detection and abatement, blue hydrogen, potential blockchain applications, and carbon capture, utilization and storage.

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CO, Storage Excellence Fund

The University of Wyoming School of Energy Resources has long been working on science, technology, outreach and policy to position Wyoming and industry for success in CO_2 storage.

Building on a foundation of innovation excellence, SER aims to undertake time-sensitive industry needs through the creation of a *CO*₂ *Storage Excellence Fund*, paving the way for success. This excellence fund will provide the support needed to transition from research to commercialization, which will ensure the success of this field long into the future. The Center for Economic Geology Research (CEGR), the Center for Energy Regulation and Policy Analysis (CERPA), and the Shell 3D Visualization Center (3D Viz) are identified as the core centers to address the topic areas.

the future. The Center in Center in the future. The Center for Energy Regulation and Policy Analysis (CENTER). Visualization Center (3D Viz) are identified as the core centers to address the topic areas. Support raised for the CO_2 Excellence Fund will create immediately expendable dollars to jump start the program as well as a multi-million dollar endowment to provide a sustained impact for generations to come.

Anyone interesting in making a contribution toward this fund, is invited to contact Angela Ver Ploeg, Director of Corporate Engagement at the UW Foundation. angela.verploeg@uwyo.edu | (307) 766-1939



School of Energy Resources