

# OKLAHOMA ENGINEERING CONFERENCE

## AGENDA

JUNE 13-14, 2024  
METROTECH – SPRINGLAKE CAMPUS  
1900 SPRINGLAKE DR.  
OKLAHOMA CITY, OK 73111

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### THURSDAY, JUNE 13

**7:30-8:00 a.m. Registration/Continental Breakfast South Lobby**

#### GENERAL SESSION

**8:00-8:25 a.m.**

**1. Welcome**

*Doug Klassen, P.E.; OSPE VP of Education*

**Rooms G/H**

**OEF Update (.5)**

*Jennifer McCollum, APR; OEF Executive Director*

**Rooms G/H**

**8:30-8:55 a.m.**

**2. PELS State Board of Licensure Legislative and Enforcement Update (1)**

*Kathy Hart, Executive Director*

*OK Board of Licensure for Professional Engineers and Land Surveyors*

**Richard Willoughby, P.E.; F.NSPE, Board Member**

*OK Board of Licensure for Professional Engineers and Land Surveyors*

**Rooms G/H**

**9:00-9:55 a.m.**

**3. A Comparison Between the NSPE Code of Ethics and the Board Rules of Professional Conduct (1)**

*Bruce Pitts*

*OK Board of Licensure for Professional Engineers and Land Surveyors*

**Rooms G/H**

The speaker will compare the NSPE Code of Ethics for Engineers with the Rules of Professional Conduct adopted by the State Board of Licensure for Professional Engineers and Land Surveyors. By contrasting the two documents, NSPE's influence on the Board's rules will become evident. Important similarities and differences will be highlighted and discussed.

**9:55-10:10 a.m.**

**NETWORKING BREAK**

**South Lobby**

**10:10-11:05 a.m.**

**4. MADE in Tulsa (1)**

*Dr. John Henshaw, Chair of Mechanical Engineering  
University of Tulsa*

**Rooms G/H**

MADE at TU is a student organization at the University of Tulsa dedicated to designing, building, and delivering devices for persons with disabilities in the Tulsa area and beyond. Founded in 2013, MADE at TU has delivered over 60 projects in the past 11 years. MADE at TU also includes graduate students performing research related to persons with disabilities. The MADE at TU organization is described along with numerous projects created by our students. Several ongoing research projects are described as well.

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**11:05 a.m.-12:00 p.m.**

**5. Oklahoma Department of Transportation Update (1)**

*Tim Gatz, Executive Director  
OK Department of Transportation*

**Rooms G/H**

**12:00-1:00 p.m.**

**Luncheon**

*Geoff Covalt, P.E., President, OSPE and  
Britt Smith, P.E., F.NSPE; Past President, NSPE  
OSPE and NSPE Update*

**Rooms G/H**

## CONCURRENT SESSIONS

**1:00-1:55 p.m.**

**6. OSHA Activity and Worker Fatalities in Oklahoma (1)**

*Jorge Delucca, Compliance Assistance Specialist  
OSHA*

**Room I**

Organization of OSHA in Oklahoma City, alliances, National and Regional Emphasis Programs, top 10 OSHA regulations cited nationwide in 2023, fatalities in Oklahoma in fiscal year 2023 and 2024 YTD. Severe injury reporting requirements, types of OSHA violations and penalties.

**7. Discussion of SUE & ASCE 38 (1)**

*Greg Jeffries, CUC, M.ASCE  
Clearline, Inc.*

**Rooms G/H**

ASCE 38-02 has been updated to ASCE 38-22 and includes a title change as well as becoming a performance and prescriptive standard. This presentation will discuss what has changed, and why a professional engineer with utility experience must be involved.

**2:00-2:55 p.m.**

**8. Future in Engineering (1)**

*Britt Smith, P.E., F.NSPE  
NSPE Past President*

**Room I**

As always, our world is changing. But recent factors such as a global pandemic, retirement of the baby boom generation, and technological advancement seems to be accelerating change. This presentation will look at issues of the workforce pipeline, emerging fields, and our licensure system to see how these changes will affect our profession. Those attending will have the opportunity to think about what adaptation they, and the profession of engineering, will need to make in the coming years as we continue to protect the public's health, safety and welfare.

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**9. Relationship Between Floodplain Management, (1)  
Stormwater Management and Stormwater Quality**  
*W.B. Smith, P.E., CFM*  
*HISINC, LLC*

**Rooms G/H**

There has historically been a separate distinction between the programs of Floodplain Management, Stormwater Management, and Stormwater Quality. However with the continuing development of Stormwater Management Programs (Stormwater Flooding outside the Regulatory Floodplain) and

Stormwater Quality (MS4) the interaction has become much more entwined. This presentation will discuss the interaction and interrelationship of these three programs within any community.

**2:55-3:15 p.m.**  
**NETWORKING BREAK**

**South Lobby**

**3:15-4:10 p.m.**

**10. Contract Issues and Liability (1)**

**Room I**

*Kevin Pratt, Partner; Professional Liability, Architects & Engineers Division Leader*  
*USI*

Review standard of care and key Professional Liability policy provisions, including warranties, professional services, contractual liability. Review and apply principles to contract clauses, including Scope of Services, Insurance Requirements, Indemnification, Standard of Care and Warranties.

**11. Solar in Oklahoma (1)**

**Rooms G/H**

*JW Peters, Owner*  
*Solar Power of Oklahoma*

What is solar energy, how does it work and why will your clients be asking about it?

**4:15-5:15 p.m.**

**12. Litigation Issues (1)**

**Room I**

*Chris Combs, Associate*  
*Hayes Magrini & Gatewood*

**13. The Oklahoma Hydronet: Developing and Integrated (1)  
Statewide Water Monitoring Network**

**Rooms G/H**

*Dr. Ali Mirchi, Associate Professor; Oklahoma State University*  
*-and-*

**Advances in Irrigation Simulation for Better Watershed Modeling**

*Dr. Tyson Ochsner, Professor; Oklahoma State University*

**The Oklahoma Hydronet:** Irrigation is crucial for food production, addressing challenges from climate change and population growth. Accurate irrigation simulation is essential for effective water resource planning and management. This presentation features SWAT-IRR, a new algorithm for the Soil and Water Assessment Tool (SWAT), enhancing simulation of different irrigation systems and schedules on

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hydrologic fluxes in agricultural areas. SWAT-IRR explicitly simulates surface, sprinkler, and drip irrigation, using parameters such as irrigation application efficiency, conveyance efficiency, surface runoff ratio, and an area adjustment factor for drip irrigation. An application at the Fort Cobb Reservoir Experimental Watershed (FCREW) in Oklahoma demonstrates its effectiveness. Results show SWAT-IRR captures the impacts of irrigation systems on the water budget and water allocation from the irrigation source. These enhanced features are crucial for examining adaptive agricultural water management strategies to protect water resources and enhance climate resilience in agricultural watersheds.

**Advances in Irrigation Simulation:** Our multi-institution team is building a statewide hydrologic monitoring network, the Oklahoma Hydronet, which aims to dramatically improve Oklahoma's ability (1) to monitor and predict droughts and floods; (2) to better manage infrastructure and resources before, during, and after extreme events; and (3) to more accurately target warning and relief efforts. The Oklahoma Hydronet is designed to be an integrated, statewide monitoring system for surface water, soil water, and groundwater, with real-time data-streams freely available to the public. The Hydronet will incorporate existing monitoring sites as well as launch new sites. Linkages to other historic and real-time datasets will provide valuable context for interpreting and modeling these new data-streams. Our team is working to develop early-warning systems enabling more effective management of floods and droughts, including the development of software and computing infrastructure to automatically ingest the new and existing data streams into a central database. That database will be dynamically linked to a new public website to allow near real-time display and analysis of soil water, groundwater, and surface water storage levels across the state and powerful new drought and flood risk indicators. This project is expected to help Oklahoma communities and state and federal agencies better monitor and manage drought and flood risks, to enhance agricultural resilience, and to lead to broader engagement of Oklahoma citizens in preparing for, managing, and recovering from hydrologic extremes. The benefits are expected to extend nationally, as the Oklahoma Hydronet can serve as a highly adaptable model for research and management of hydrologic extremes for other states.

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### FRIDAY, JUNE 14

**7:30-8:00 a.m.**      **Registration/Continental Breakfast**  
*Breakfast Sponsored by MKEC*

**South Lobby**



### CONCURRENT SESSIONS

**8:00-8:55 a.m.**

**14. Ownership and Growing Your Career (1)**

*Trish Hatley, P.E., F.NSPE, Executive Vice President  
Freese and Nichols  
Eric Waggoner, P.E., Transportation Engineer  
Freese and Nichols*

**Rooms G/H**

This presentation will explore the critical role of individual ownership in responding to change and fostering career growth and leadership. We will discuss how taking ownership can significantly impact professional development and highlight the importance of owning one's healthy work-life balance. Additionally, we will showcase NSPE's Emerging Leaders Program and Women's Leadership Program, illustrating how these initiatives support and empower professionals in their journey towards effective leadership, career advancement and work-life balance.

**15. Assessment of New Technology (1)**

*Tom Poteet, Vice President Corporate Development  
MESA Solutions*

**Room I**

As engineers are called upon to solve problems, new technology is often a part of the solution choices. This presentation reviews a few traditional frameworks for determining the need for and maturity of "new" technology, and then looks at a few relevant questions to help guide the implementation of solutions.

**9:00-9:55 a.m.**

**16. The Multi-Modal NEVI Experience (1)**

*Jared Schwennesen, P.E., Manager  
Multi-Modal Division, Oklahoma Department of Transportation*

**Rooms G/H**

Through the Modernization of the Transportation Cabinet, a new division was created to combine and expand the alternative modes of surface transportation. Along with other modes are the alternative fuels such as Electric and Hydrogen. Multi-Modal is responsible for spending \$66 million in NEVI funding to build out the national EV charging infrastructure in OK.

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### **17. A New Home for OSU Agriculture (1)**

**Room I**

*Dr. Randy Raper, Assistant Director  
OSU Ag Research*

The New Frontiers project will provide a new home for Oklahoma State University Agriculture on the OSU campus in Stillwater, Oklahoma, and will transform and advance teaching, research and Extension

methods, benefiting Oklahoma's citizens. The 192,000 sq. ft. building will replace Agricultural Hall occupied in 1968. The new building will contain 8 modern classrooms designed with maximum flexibility. The classrooms can be used for large class instruction or to facilitate small group interactions. Additionally, modern teaching laboratories with transparency allow potential new students to view activities from the hallway through large glass windows. Transparency and flexibility were key components used to design the more than 25,000 sq. ft. modern research laboratories. These laboratories will facilitate research into soils, plants, ecology, genomics and digital agriculture. The most important difference between the current building and the new facility is the more than 3000 sq. ft. collaborative space, enabling students and faculty to interact regularly. The new building will be a "destination" where students will gather in the morning for classes and continue to socialize throughout the day. We anticipate moving in on July 29 when we will receive Full Occupancy!

### **9:55-10:15 a.m. NETWORKING BREAK**

**South Lobby**

### **10:15-11:10 a.m.**

### **18. Oklahoma Turnpike Authority Update (1)**

**Rooms G/H**

*Joe Echelle, P.E., Executive Director,  
Oklahoma Turnpike Authority*

### **19. The Medical Marijuana Industry and its Engineering Effects**

**Room I**

**Richard Willoughby, P.E., F.NSPE, Board Member**

*OK Board of Licensure for Professional Engineers and Land Surveyors*

### **11:15 a.m. – 12:10 p.m.**

### **20. STEAM Engine (1)**

**Rooms G/H**

*Morgan Jones, AIA, MBA; Founder/Executive Director  
The STEAM Engine*

Have you ever wondered why Oklahoma has a hard time finding, recruiting, and retaining entry-level engineering talent? Join Morgan Jones, a registered architect, to learn about what led her to start the STEAM Engine, a 501(c)3 nonprofit working to address the issue right here in Oklahoma. She'll describe the two-fold problem facing our state and how the STEAM Engine is working to connect the education pipeline to industry by introducing kids to career pathways through hands-on STEM and Arts programming.

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### **21. Permanent Magnet Motors for Reduction of Carbon (1)**

**Room I**

*Emissions in Oil Well Production Applications*  
*Walter Dinkins, P.E.*  
*Lavare International*

The use of permanent magnet motors (PMM) in electric submersible pump (ESP) oil production meets operators requirements for higher efficiency systems to help reduce carbon footprint. The calculation of carbon credits can be complicated by rapidly changing power required in typical oil wells. Will present power studies of conventional induction motor versus PMM systems along with safety considerations applicable to latter type. Finally, alternative applications such as low speed progressing cavity pumps, high speed ESP and linear PMM will be presented.

**12:15-1:15 p.m.**

### **Luncheon**

*Rep. Nicole Miller*

**Rooms G/H**

Rep. Miller proudly represents northwest Oklahoma City, west Edmond and Deer Creek in House District 82. Miller grew up throughout the central U.S. and eventually settled in the Fort Worth area. After earning a bachelor's degree in government service from Texas Women's University, she moved to Washington, D.C., where she focused on defense sector policy issues.

Miller spent the next several years as a military spouse, living coast to coast and overseas during her husband's 20-year career with the Air Force. After moving to Oklahoma City, she worked with the Oklahoma National Guard and the Oklahoma Department of Veterans Affairs.

Since being elected to the Oklahoma House of Representatives in 2018, she has developed a reputation as a strong and articulate advocate on a number of legislative issues. In her first term, Miller was presented with the Rising Star Award by the State Chamber of Commerce for her role as a legislative leader in the business community. She was one of 20 legislators chosen from within the southern region to attend the Center for the Advancement of Leadership Skills (CALs) in 2019. She was named as the 2022 Legislator of the Year by the National Guard Association of Oklahoma in recognition for her work on education benefits for members of the Oklahoma National Guard.

Miller and her husband, Doug, have two children and attend Heritage Baptist Church.

## **GENERAL SESSION**

**1:15 – 2:10 p.m.**

### **22. Uniquely Oklahoman: The Oklahoma Energy Resources Board's Industry-Leading Initiatives in Education and Land Restoration (1)**

*Mindy Stitt, Executive Director*  
*OERB*

**Rooms G/H**

Executive Director Mindy Stitt will explain how the people of Oklahoma Oil and Natural Gas are voluntarily funding the OERB's pioneering efforts in education and land restoration. Through innovative educational outreach and a robust environmental restoration program, the people of Oklahoma Oil &

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Natural Gas are setting a national standard for how the industry can positively impact our communities while fostering the next generation of energy leaders. Today, you will learn more about these uniquely Oklahoman initiatives and their profound impact on the state.

**2:15-3:10 p.m.**

**23. CANOO Manufacturing (1)**

*Amit Ranjan, Manufacturing Engineering  
CANOO*

**Rooms G/H**

Canoo is establishing manufacturing facilities for its cutting-edge Electric Vehicles, aiming for a cleaner and greener future. Currently, the focus lies on two facilities: one in Pryor, OK, dedicated to producing EV batteries, and another in Oklahoma City, where the rest of the vehicle is assembled. Canoo's vehicles utilize a skateboard system approach, offering remarkable flexibility in configuring vehicles for various applications, such as NASA's Crew Transport Vehicle. Canoo takes pride in the fact that astronauts on the NASA Artemis mission will cover the first 9 miles of their journey in Canoo vehicles. The unique features of Canoo's products that enable these achievements also drive innovations in the manufacturing process. For instance, Canoo is the pioneer in developing a silicone encapsulation technique for battery cells in a non-encapsulated battery pack. Additionally, Canoo has devised a proprietary technology for frame-level water sealing, enabling vacuum and pressure testing of an entire vehicle frame. Without this method, vehicle manufacturers are restricted to designs that only allow for fully sealed battery packs. This presentation will outline Canoo's production plans for Oklahoma and highlight some of the innovative approaches the company is pursuing.

**3:10-3:25 p.m.**

**NETWORKING BREAK**

**South Foyer**

**3:25-4:55 p.m.**

**24. Putting the "P" in "JPL": 88 Years of Propulsion (1.5)  
History at NASA's Jet Propulsion Lab**

*Todd Barber, Propulsion Engineer, NASA*

**Rooms G/H**

From modest beginnings in the era of early liquid rockets through state-of-the-art propulsion systems flown on 21st-century spacecraft, propulsion technologies have advanced dramatically through the decades. Over three quarters of a century of propulsion experience at NASA Jet Propulsion Laboratory will be discussed chronologically, including innovative practices in solid and liquid propulsion now considered the status quo. These propulsion advancements will be discussed in the context of early JPL propulsion history before NASA formed in 1958, along with a myriad of robotic lunar and planetary missions since the 1960s.

***Adjourn***