

2023 NSPE-  
WI (WSPE)  
Discovery  
Virtual  
Conference

March 2 – April 4  
2023

## VIRTUAL CONFERENCE SCHEDULE: **March 2 thru April 4, 2023**

No.	Discipline	Date (CST)	Time	PDH	Speaker	Presentation Title
1a	Ethics	Thurs., March 02, 2023	12:00-1:30 PM	1.5	Rebecca Bowman	Intersection of Sustainability, Competence, and Ethics
2a	Hydraulic	Tues., March 07, 2023	12:00-1:00 PM	1.0	Rebecca Alcock	Response to the COVID-19 PPE Shortages: Reflections from the (Virtual) Trenches
2b	Multi-Disc.	Thurs., March 09, 2023	12:00-1:00 PM	1.0	Lennon Rodgers	Engineering and Innovation in Response to COVID-19
3a	Civil/Envir.	Tues., March 14, 2023	12:00-1:00 PM	1.0	Dan Nemke & Chad Olson	BC Organics Project
3b	Bio-Medical	Thurs., March 16, 2023	12:00-1:00 PM	1.0	Dr. Gul Sadiq Afshan	Vaccines – Are they a modern-time miracle or menace?
4a	Civil	Tues., March 21, 2023	12:00-1:00 PM	1.0	Fred Groth & Meghann Riedner	Structural Challenges of the Science & Technology Center at UW River Falls
4b	Envir.	Thurs., March 23, 2023	12:00-1:00 PM	1.0	Dr. Ron Zalesny & Dr. Bart Sexton	Phytotechnologies for Communities and the Environment
5a	Arch.	Tues., March 28, 2023	12:00-1:00 PM	1.0	Jonathan Parker	The Wisconsin Center Expansion
5b	AI Apps	Wed., March 29, 2023	12:00-1:00 PM	1.0	Dr. John Garrett	Addressing Novel Diseases with AI & Medical Imaging: Lessons Learned from Covid-19
5c	Ethics	Thurs., March 30, 2023	12:00-1:30 PM	1.5	Rebecca Bowman	Florida International University Pedestrian Bridge Failure
6a	Civil	Tues., April 4, 2023	12:00-1:30 PM	1.0	Mike Vogel, Joe Parker & Jason Gross	Structural Engineering Challenges on The Wisconsin Center Expansion

**Please circle PDH hour noting course you attended along with initial under.** Conference organizers recommend that in addition to this brochure, retain any session handouts or personal notes. DSPS rules indicate that they can request this information to confirm attendance and content of PDH sessions in case of audit.

*By my signature, I attest that I attended the above circled PDH hour marked sessions in their entirety and qualify for the PDH's assigned.*

Printed Name: \_\_\_\_\_

Signature: \_\_\_\_\_

## Virtual Session No. 1a

(1.5 PDH)

**Thursday, March 02, 2023 | 12:00 – 1:30 PM CST**

**Speakers:** Rebecca Bowman, Esq, P.E., D.F.E.  
*National Society of Professional Engineers*

**Topic:** Sustainability and ethics

Participants will examine the intersection of sustainability, competence, and ethics.

## Virtual Session No. 2a

(1 PDH)

**Tuesday, March 07, 2023 | 12:00-1:00 PM CST**

**Speakers:** Rebecca Alcock  
*University of Wisconsin, Department of Industrial Engineering*

**Topic:** Response to the COVID-19 PPE Shortages: Reflections from the (Virtual) Trenches

The COVID-19 pandemic was marked by widespread shortages of personal protective equipment (PPE). Many domestic suppliers pivoted to producing PPE, but a key challenge that remained was the lack of an established marketplace to connect non-traditional suppliers to healthcare facilities. In response, we created an optimization model, Shield-Net, to match face shield requests with suppliers. Between March and September 2020, Shield-Net produced 390 matches, resulting in the shipment of 50,000+ face shields. This work contributed to the development of local PPE production initiatives, and eventually infrastructure projects, in Guatemala with Engineers Without Borders and around the world with the United Nations Development Programme.

## Virtual Session No. 2b

(1.0 PDH )

**Thursday, March 09, 2023 | 12:00 – 1:00 PM CST**

**Speakers:** Dr. Lennon Rodgers, PhD  
*Grainger Engineering Design Innovation Lab*  
*University of Wisconsin - Madison*

**Topic:** Engineering and Innovation in Response to COVID-19

Lennon Rodgers, Director of the Grainger Engineering Design Innovation Lab at UW-Madison, will describe how the lab quickly designed a low-cost, open sourced, easy-to-build face shield, the Badger Shield, to address PPE supply shortages in the early days of the COVID-19 pandemic. Millions of Badger Shields have been used around the world. Lennon will also present other collaborations between the UW College of Engineering and UW Hospital during the first year of the COVID-19 pandemic.

## Virtual Session No. 3a

(1.0 PDH )

**Tuesday, March 14, 2023 | 12:00-1:00 PM CST**

**Speaker:** Chad Olson, PE, BCEE      and      Dan Nemke  
*McMahon Associates, Inc.*                      *Dynamic Renewables*

**Topic :** BC Organics Project

The BC Organics Project utilizes anaerobic digestion and advanced filtration to treat nearly 1 million gallons per day of manure. The biogas captured through the digestion process is upgraded to renewable natural gas (RNG) and injected into the pipeline system. A portion of the biogas also powers a combined heat and power (CHP) system that provides renewable electricity and heat to the facility. The digestate is treated through a series of filtration steps to separate it into a fiber product, a concentrated phosphorus fertilizer product, a concentrated nitrogen and potassium fertilizer product, and clean water. One of the primary goals of the project is to improve the water quality in the Lower Fox River Watershed by providing the participating farms with products that assist in improving manure management practices and promoting soil conservation practices.

## Virtual Session No. 3b

(1.0 PDH)

**Thursday, March 16, 2023 | 12:00 – 1:00 PM CST**

**Speakers:** Dr. Gul Sadiq Afshan, PhD  
*Milwaukee School of Engineering (MSOE)*

**Topic:** Vaccines – Are they a modern-time miracle or menace?

This talk furnishes basic knowledge about the history and types of vaccines and the multiple ways they impacted and changed the quality and “quantity” of life for all animals including human beings. The talk will specifically address vaccines in relation to Coronavirus that caused the 2019 Covid-19 pandemic.

## Virtual Session No. 4a

(1.0 PDH)

**Tuesday, March 21, 2023 | 12:00 – 1:00 PM CST**

**Speaker:** Fred Groth, PE, SE & Meghann Riedner, PE, SE  
*GRAEF*

**Topic:** Structural Challenges in designing a state-of-the-art Science and Technology Center at UW River Falls

Presentation will focus on structural challenges while designing this project. Challenges included finding the right structural system that could offer future flexibility for renovations every 10 years, a larger structural bay (42'-8" x 32'-0") per the program requirements, and design issues including sensitive equipment with vibration velocities less than 2000 uin/sec. Presentation will also address other architectural/program challenges that had to be solved.

## Virtual Session No. 4b

(1.0 PDH )

**Thursday, March 23, 2023 | 12:00 – 1:00 PM CST**

**Speaker:** Dr. Ron Zalesny, PhD & Dr. Bart Sexton, PhD  
*USDA Forest Service & Sand County Environmental*

**Topic:** Phytotechnologies for Communities and the Environment

Phytotechnologies are nature-based solutions involving the strategic use of plants to solve environmental problems in rural and urban communities. Phytotechnologies are classified according to one or more biological recovery activities: rehabilitation, restoration, reclamation, and remediation. Phytoremediation, the use of trees to clean contaminated soils and waters, is the most common phytotechnology implemented globally to accumulate, immobilize, metabolize and/or volatilize pollutants. Other primary phytotechnologies include: mine reclamation systems, constructed wetlands, rain gardens, urban tree canopies, green infrastructure plantings, and vegetative forest buffers. Ron Zalesny (USDA Forest Service) will highlight the science behind phytotechnologies, focusing on silvicultural prescriptions and examples most relevant for engineers designing these systems (e.g., plant selection, monitoring). Bart Sexton (Sand County Environmental) will share advances and challenges of real-world phytotechnology applications being used to benefit local communities and enhance ecosystem services (e.g., clean water, healthy soils).

## Virtual Session No. 5a

(1.0 PDH )

**Tuesday, March 28, 2023 | 12:00 – 1:00 PM CST**

**Speaker:** Jonathan Parker, AIA  
*Eppstein Uhen Architects*

**Topic:** The Wisconsin Center Expansion

Learn about the project drivers, design options, and construction of the \$410,000,000, 1.2 million square foot Wisconsin Center convention center renovation and expansion in Milwaukee, Wisconsin.

## Virtual Session No. 5b

(1.0 PDH )

**Wednesday, March 29, 2023 | 12:00 – 1:00 PM CST**

**Speaker:** Dr. John Garrett, PhD  
*Departments of Radiology and Medical Physics  
The University of Wisconsin-Madison School of Medicine and Public Health*

**Topic:** Addressing Novel Diseases with Artificial Intelligence and Medical Imaging: Lessons Learned from Covid-19

When COVID-19 first emerged as a global pandemic, our health systems were quickly overwhelmed. Rapid testing wasn't readily available at all locations to identify COVID-19 patients and ventilators and ICU beds were in high demand. Radiology was often a front-line tool used to diagnose and triage patients. However, even experienced radiologists struggled to differentiate COVID-19 from other diseases with similar presentations early in the pandemic. In addition, even with a known diagnosis the ventilation needs for sick patients were hard to predict, putting great strain on ICUs. In recent years, deep learning tools have shown great promise in analyzing medical images for triage and diagnostic tasks. One of the great advantages of deep learning tools is that they can be quickly trained on large datasets to perform specific tasks. One unique challenge of medical imaging AI applications is that patient data, including images, are highly sensitive and difficult to anonymize and share. Historically this has meant that creating large, diverse dataset needed to train accurate deep learning models is difficult. Federated learning is a new approach that allows distributed training of models in a secure way to preserve patient privacy. In this talk we will review ways our group has leveraged deep learning and federated learning tools to help develop a suite of tools to help differentiate COVID-19 from other pneumonias on chest radiographs and to predict oxygen needs for patients who are acutely ill with COVID-19. These tools not only have served us through this specific pandemic, but laid the framework for quickly addressing emerging diseases, even as healthcare professionals are first seeing these diseases.

## Virtual Session No. 5c

(1.0 PDH )

**Thursday, March 30, 2023 | 12:00 – 1:00 PM CST**

**Speakers:** Rebecca Bowman, Esq, P.E., D.F.E.  
*National Society of Professional Engineers*

**Topic:** Florida International University Pedestrian Bridge Failure, A Study in Structural Ethics or Ethical Structures

On March 15<sup>th</sup> 2018 a pedestrian bridge across a 6 lane highway being built for the Florida International University failed and fell across the highway killing 5 occupants of crushed cars and a worker. An additional ten persons were injured, six seriously. The bridge was constructed using a design/build contract and an Accelerated Bridge Construction method.

This seminar examines the failure and identifies the various times in the design/build process that the design flaws could have been identified and corrected, preventing the failure. The seminar will also discuss the apparent ethical issues arising during the design and building of the bridge, leading to its failure.

## Virtual Session No. 6a

(1.0 PDH )

**Tuesday, April 04, 2023 | 12:00 – 1:00 PM CST**

**Speaker:** Mike Vogel, PE, SE, Joe Parker, PE, SE & Jason Gross, PE, SE  
*GRAEF*

**Topic:** Structural Engineering Topics on The Wisconsin Center Expansion

GRAEF will present on many of the structural engineering challenges of the \$450 million Wisconsin Center Expansion and some surprises we found along the way.