

# *SHARING YOUR VOICE EXTENDING YOUR REACH*

**2ND ANNUAL  
GWEN SYMPOSIUM**

*FEBRUARY 7, 2023*

*Program Booklet*



Women in Engineering Program

# SYMPOSIUM NETWORKING ACTIVITIES

Throughout the Symposium, we offer multiple activities to participate in:

## Professional Headshots

Have your picture taken by a professional photographer to elevate your LinkedIn profile, or other networking sites! The photographer will be located in STEW 306 and will be available from 9:00am-9:30am and 1:15pm-1:45pm.

## Symposium Bingo

Keep your eye out for opportunities to fill out your symposium bingo card, located on the back cover of this Program Booklet. Fill out the box appropriately (i.e., respond to prompts) and check off boxes that you complete. To complete a "Bingo," check off four boxes to create a line. Note: Your line can only include ONE yellow box. At the end of the day, show your completed Bingo Card to the WiE Staff at the Check-In Desk to receive a prize.

## Name Badge Stickers

Find a friend, and swap a sticker! Your name badge contains a unique set of stickers. As you meet people throughout the day, we encourage you to find similarities between you and your peers. When you identify something that you have in common with another person, swap stickers with them and use it to decorate your name badge!

## Where in the world are WiE?

Place one of your stickers on your hometown on the MAP located near the check-in desk. Let's see how big the Purdue WiE Program network is!

**Registered participants that attend all sessions and are present at the Networking Reception will be eligible to win one of five (5) \$1000 door prizes!**

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## AGENDA

**9:00 AM:** Sign-in opens (Outside STEW 302)

**9:30 AM - 10:15 AM: Opening Plenary featuring Dr. Bich-Van Pham (STEW 302)**

Associate Director of R&D Breakthrough Innovation for Prepared Foods, Tyson, Chicago IL  
Ph.D. Chemical Engineering, Purdue University  
B.S. Chemical Engineering, Northwestern University

**10:15 AM - 10:30 AM:** Transition & Break

**10:30 AM - 11:30 AM:** Session 1 - College of Engineering Graduate Student Presentations

### **Room 1: Traditional Talks (STEW 214A)**

**Alumna Speaker: Dr. Velvet Basemera-Fitzpatrick, Moderator: Burla Ondes**

Deep Learning Cardiac Segmentation of Dual Ultrasound and Photoacoustic Image Data  
*Katherine Leyba, Biomedical Engineering*

Deep learning driven adaptive optics for single molecule localization microscopy  
*Peiyi Zhang, Biomedical Engineering*

Physics Informed Neural Networks to reduce uncertainty in experimental measurements  
*Shanmukhi Sripada, Mechanical Engineering*

Crop residue estimation using SAR  
*Lena Azimi, Civil Engineering*

Surviving the Unexpected - Designing and Implementing Safety Controls with Resilience  
Power

*Rashi Jain, Aeronautics and Astronautics Engineering*

*Session 1 Continued on the Next Page*

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## AGENDA

### **Room 2: Traditional Talks (STEW 214B)**

**Alumna Speaker: Dr. Jessica Sargent-Brown, Moderator: Anne Serban**

Blast Effects on Steel-Plate Composite (SC) Structures: Design for Direct Shear

*Margaret Perlman, Civil Engineering*

Optimal digital design of flexible modular mini-plants for distributed drug manufacturing

*Ilke Akturk, Chemical Engineering*

A Holistic Approach for the Model-based Control of Crystal Size and Purity in Integrated Continuous

Crystallization-Wet Milling-Classification Systems

*Rojan Parvaresh, Chemical Engineering*

Viability of Focused Ion Beam Milling to Machine Crystalline Explosives

*Kerry-Ann Stirrup, Materials Engineering*

Process Intensification of Energetics Crystallization via model-free Quality-by-Control Direct Design Approaches

*Montgomery Smith, Chemical Engineering*

### **Room 3: Popular Press (STEW 214 C/D)**

**Alumna Speaker: Dr. Karen Son, Moderator: Elizabeth Sanders**

Utilizing Transdisciplinary Project-Based Learning in Undergraduate Engineering Education

*Lacey Davis, Aeronautics and Astronautics Engineering*

Sensing and Memory via Engineered Materials

*Katie Riley, Mechanical Engineering*

Solution Processed  $\text{Ag}_2\text{ZnSnSe}_4$  for Scalable Solar Panel Manufacturing

*Anna Murray, Materials Engineering*

Criteria Development to Assess Pack-out Corrosion Effects in Steel Built-up Members

*Myriam Sarment, Civil Engineering*

Thermocouple-Based Anomaly Detection in Fused Filament Fabrication

*Anna Keim, Mechanical Engineering*

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## AGENDA

**11:30 AM - 11:45 AM:** Transition & Break

**11:45 AM - 1:30 PM:** Lunch and Keynote Panel (STEW 302)

**Dr. Velvet Basemera-Fitzpatrick, Panelist**

*Senior Program Officer, National Academies of Sciences, Engineering, and Medicine*

*Ph.D. Engineering Education, Purdue University*

*M.S. Civil Engineering, Purdue University*

**Dr. Molly Goldstein, Panelist**

*Teaching Assistant Professor & Product Design Manager, Industrial and Enterprise*

*Systems Engineering, University of Illinois Urbana-Champaign*

*Ph.D. Engineering Education, Purdue University*

*M.S. Entrepreneurial Engineering, University of Illinois Urbana-Champaign*

*B.S. General Engineering, University of Illinois Urbana-Champaign*

**Dr. Jessica Sargent-Brown, Panelist**

*Research Engineer, Cook Advanced Technologies*

*Ph.D. Materials Engineering, Purdue University*

*M.S. Chemical Engineering, Purdue University*

*B.S. Polymer & Fiber Engineering, Auburn University*

**Dr. Karen Son, Panelist**

*Thermal Analyst, Sandia National Laboratories*

*Ph.D. Mechanical Engineering, Purdue University*

*M.S. Mechanical Engineering, Purdue University*

**Dr. Fengqing Maggie Zhu, Panelist**

*Associate Professor, Elmore Family School of Electrical & Computer Engineering,*

*Purdue University*

*Ph.D. Electrical & Computer Engineering, Purdue University*

*M.S. Electrical & Computer Engineering, Purdue University*

**1:30 PM - 1:45PM:** Transition & Break

# SHARING YOUR VOICE, EXTENDING YOUR REACH

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## AGENDA

**1:45 PM - 2:45 PM:** Session 2 - College of Engineering Graduate Student Presentations

### **Room 1: Traditional Talks (STEW 214A)**

**Alumna Speaker: Dr. Molly Goldstein, Moderator: Burla Ondes**

Representing Multiple in vitro Tuberculosis Infection Models with a Single in silico Agent-Based Model

*Alexa Petrucciani, Biomedical Engineering*

Characterizing tuberculosis granuloma dynamics using computational modeling

*Alexis Hoerter, Biomedical Engineering*

An Optimization Framework for Distributed Manufacturing of Electrified Chemical Processes

*Asha Ramanujam, Chemical Engineering*

A Brief Introduction to Multiobjective Simulation Optimization Problems

*Burla Ondes, Industrial Engineering*

### **Room 2: Traditional Talks (STEW 214B)**

**Alumna Speaker: Dr. Bich Van C. Pham, Moderator: Elizabeth Sanders**

Dominant scattering mechanisms in InSbAs quantum wells

*Sara Metti, Electrical and Computer Engineering*

Atomistic view of metallic systems

*Victoria Tucker, Materials Engineering*

First-Principles Analysis of the Ammonia Decomposition Reaction on High Entropy Alloy Catalysts

*Zuhal Cakir, Chemical Engineering*

Controlling Quantum Emitter Performance In Nanophotonic Cavities For On-Chip Cavity QED

*Haimabati Dey, Electrical and Computer Engineering*

### **Room 3: Pecha Kucha (STEW 214 C/D)**

**Alumna Speaker: Dr. Jessica Sargent-Brown, Moderator: Olivia Brandt**

Human Factors Research at the Mars Desert Research Station

*Arly Black, Aeronautics and Astronautics Engineering*

Cislunar Space Surveillance

*Surabhi Bhadauria, Aeronautics and Astronautics Engineering*

Enhancing Thermal Conduction in Polymers

*Angie Daniela Rojas Cardenas, Materials Engineering*

*Session 2 Continued on the Next Page*

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## AGENDA

Adhesion of Recycled Carbon Fiber Reinforced Composites to Aluminum

*Nicole Balog, Materials Engineering*

Analysis of Contaminants on Ground Glass Pozzolan and the Effects on Pozzolan

Performance in Mortar

*Nicole Franklin, Materials Engineering*

**2:45 PM - 3:00 PM:** Transition & Break

**2:45 PM - 3:00 PM:** Poster Set-up (STEW 306)

**3:00 PM - 4:00 PM:** Session 3 - College of Engineering Graduate Student Presentations

### Room 1: Traditional Talks (ROOM 214A)

**Alumna Speaker: Dr. Bich Van C. Pham, Moderator: Olivia Brandt**

Roll-to-Roll Manufactured MoS<sub>2</sub>-Carbon Nanotube Sensors for Selective Detection of Acetone

*Ya-Ching Yu, Materials Engineering*

High Throughput Platform for Understanding Macromolecular Interactions with Collagen and Hyaluronan

*Paulina Babiak, Chemical Engineering*

Characterization of composite hydrogel-Portland cement hydration products

*Caitlin Adams, Materials Engineering*

Steel Concrete Composite L-Joint Connection

*Amanda Lefebvre, Civil Engineering*

### Room 2: Popular Press (STEW 214 C/D)

**Alumna Speaker: Dr. Karen Son, Moderator: Anne Serban**

Paper-based Lateral Flow Immunoassay for HPV Protein Detection

*Lucy Teclé, Biomedical Engineering*

Enzymatically Signal Enhanced Lateral Flow Assay Test for HIV using p24

*Pankti Thakkar, Biomedical Engineering*

Introducing Fundamental Quantum concepts to K-12 Students and Teachers

*Zeynep G Akdemir, Engineering Education*

Liquid flux assisted growth mechanism for the chalcogenide perovskite - BaZrS<sub>3</sub>

*Kiruba Catherine Vincent, Chemical Engineering*

*Session 3 Continued on the Next Page*

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## AGENDA

### Room 3: Workshop Roundtable (STEW 302)

**Alumna Speakers: Dr. Velvet Basemera-Fitzpatrick & Dr. Molly Goldstein**

**Moderators: Burla Ondes & Elizabeth Sanders**

Predicting Case-mix Resident Service Need in Nursing Homes

*Shujin Jiang, Industrial Engineering*

BBB-on-a-Chip: An in vitro Blood-Brain Barrier Model After Traumatic Brain Injury

*Nikita Krishnan, Biomedical Engineering*

Inclusivity and accessibility of Virtual Reality

*Nuela Chidubem Enebechi, Industrial Engineering*

An Analysis of Chemical Engineering Students' Self-Regulatory Beliefs and Processes in an Introductory Materials and Energy Balances Class

*AraOluwa Adaramola, Chemical Engineering*

Silicon Carbide MOSFET and the era of sustainable electrification

*Rajni Sah, Electrical and Computer Engineering*

Is Hydrogen-based Steel making - The Future?

*Sindhu Meenakshi Panaiyappan, Industrial Engineering*

Model-directed experiment to measure particle flow behavior

*Kayli Henry, Materials Engineering*



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## AGENDA

**4:00 PM - 6:00 PM:** Poster Presentations & Networking Reception (STEW 306)

Moderator: Anne Serban

Extraterrestrial Habitat

*Juliana Pereira, Civil Engineering*

Transitions in the Workflow of a Psychiatric Unit During the COVID-19 Pandemic and Design Implications

*Raquel Ruiz, Civil Engineering*

Cortical Bone Microdamage and Modulation by Hydration Thereof

*Mary Arnhart, Mechanical Engineering*

Crack Growth in Human cortical Bone: In-Situ Loading with 3D imaging

*Glynn Gallaway, Mechanical Engineering*

Hydrogel porosity and mechanical property tuning for cell infiltration and osteointegration

*Claudia Benito Alston, Biomedical Engineering*

Multi Modal Drug Delivery Platform for Functional Restoration of Spinal Cord via White Matter Repair

*Shiva Sharma, Biomedical Engineering*

Development of Vision and Eye Care Devices in Soft Contact Lenses

*Seul Ah Lee, Biomedical Engineering*

Assessment of Innovative Repair Methods for Corroded Steel Girder Bridges Using House of Quality Matrix

*Anna Tarasova, Civil Engineering*

A computational framework of electrochemistry and mechanical degradation in Li ion battery NMC cathodes

*Jiaxiu Han, Mechanical Engineering*

Multiphase modeling of particle/air counter flow in a parallel plate fluidized bed heat exchanger

*Krutika Appaswamy, Mechanical Engineering*

## ALUMNAE SPEAKERS

### **Dr. Velvet Basemera-Fitzpatrick**

Velvet Basemera-Fitzpatrick, Ph.D., PMP is in the business of innovation. She is interested in the use of private equity in facilitating new solutions, technologies, and enterprises in transport, and other infrastructure areas, in achieving a more sustainable and equitable future. Velvet is a Senior Program Officer at the National Academies of Sciences, Engineering, and Medicine in Washington, D.C. She credits WiE Program for her leadership growth throughout her education at Purdue and graduated MSCE '09 and PhE ENE '14.



### **Dr. Molly H. Goldstein**

Dr. Molly H. Goldstein is a Teaching Assistant Professor and Product Design Lab Director in Industrial and Enterprise Systems Engineering at the Grainger College at the University of Illinois. Dr. Goldstein earned her Ph.D. in Engineering Education at Purdue University in 2018. During this time, she was awarded the College of Engineering Outstanding Research Award and was a Bilsland Fellow. Dr. Goldstein's research focuses on student designer trade-off decisions through the study of their design actions and thinking. Her studies often involve educational and professional contexts with cross-disciplinary collaborations. She has a B.S. in General Engineering (Systems Engineering & Design) and M.S. in Systems and Entrepreneurial Engineering, both from the University of Illinois, Urbana-Champaign. Prior to pursuing her Ph.D., she worked as an environmental engineer specializing in air quality, influencing her focus in engineering design with environmental concerns.



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## ALUMNAE SPEAKERS

### **Dr. Bich Van C. Pham**

Bich-Van currently is the Associate Director of R&D Breakthrough Innovation for Prepared Foods at Tyson, leading a team to deliver new fully cooked products quickly to market. She has extensive experience in the consumer packaged goods (CPG) industry spanning discovery, product innovation, commercialization, packaging, and project management thru her 13 years at PepsiCo in both food and beverage products and now Tyson. She has also worked at a national lab and small business in addition to large billion-dollar companies. Bich-Van received her Ph.D. in Chemical Engineering from Purdue and her B.S. in Chemical Engineering from Northwestern University. While at Purdue, she was an active member of WiE Program and was a part of the Graduate Mentor Program leadership team. She continues to be an advocate for DE&I and for STEM, leading in SWE, PepsiCo's Women's Inclusion Network, and beyond. Bich-Van has 2 kids, a 6 year old daughter, and 4 year old son. Her other interests include eating (benefit of working in the food industry!), traveling, photography/arts/crafts, and reading (if she has any time to spare).



### **Dr. Jessica Sargent-Brown**

Jessica Sargent-Brown holds a B.S. in Polymer & Fiber Engineering from Auburn University and an M.S. in Chemical Engineering and Ph.D. in Materials Engineering from Purdue University. While at Purdue, she worked for 3 years as a graduate research assistant for WiE Program's Pre-College Outreach program. Upon graduation in 2020, she went to work in electronic warfare for the Naval Surface Warfare Center, Crane Division. In early 2022 she had the opportunity to return to West Lafayette and join Cook Advanced Technologies, where she works as a research engineer focused on early-stage medical device development. She and her husband currently spend most of their free time remodeling their home and raising backyard chickens.



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## ALUMNAE SPEAKERS

### **Dr. Karen Son**

Dr. Karen N. Son is a thermal analyst at Sandia National Laboratories. Karen specializes in modeling fire environments and designing experiments to validate stylized and reduced fidelity models. Prior to joining Sandia in 2018, Karen was a NASA Space Technology Research Fellow at Purdue University where she earned a Ph.D. in Mechanical Engineering under the advisement of Dr. Suresh Garimella. Her dissertation research focused on characterizing transport phenomena in sorbent beds as part of a collaboration with NASA to develop carbon dioxide removal systems for advanced space exploration. Karen enjoys spending time outside and volunteering with Albuquerque Mountain Rescue.



### **Dr. Fengqing Maggie Zhu**

Fengqing Maggie Zhu is an Associate Professor of the Elmore Family School of Electrical and Computer Engineering at Purdue University, West Lafayette, Indiana. Dr. Zhu received the B.S.E.E. (with highest distinction), M.S. and Ph.D. degrees in Electrical and Computer Engineering from Purdue University in 2004, 2006 and 2011, respectively. Her research interests include image processing, computer vision, video compression and digital health. Prior to joining Purdue in 2015, she was a Staff Researcher at Futurewei Technologies, where she received a Certification of Recognition for Core Technology Contribution in 2012. She is the recipient of an NSF CISE Research Initiation Initiative (CRII) award in 2017, a Google Faculty Research Award in 2019, and an ESI and trainee poster award for the NIH Precision Nutrition workshop in 2021. Dr. Zhu is a senior member of the IEEE.



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## *ABOUT THE WOMEN IN ENGINEERING PROGRAM (WIE PROGRAM)*

### **History**

Established in 1969, the Purdue Women in Engineering Program (WiE Program) was the first of its kind in the nation and has been a model for such programs at other universities. Since then, the enrollment of women in the College of Engineering has increased from less than one percent to the current 26 percent. To date, the College of Engineering has granted more than 13,000 engineering degrees to women, thanks in large part to the WiE Program's efforts.

### **Mission**

The Women in Engineering Program at Purdue University is dedicated to enriching the profession of engineering through the full participation of women. We develop and direct activities that provide:

- encouragement for girls and young women to study engineering
- information about careers and companies
- an environment conducive to the successful completion of students' studies

We also strive to maintain strong relationships with alumnae, friends, corporations and foundations who generously support our program.

### **Objectives**

- To provide career information and encouragement to pre-college girls and young women to continue achievement in math and science and consider engineering as an appropriate career choice.
- Encourage women to matriculate at Purdue University in the College of Engineering.
- Ensure a climate in the College of Engineering that allows young women to reach their full potential.
- Provide opportunities for women engineering students to develop leadership skills that can be utilized in their future lives.
- Encourage women to consider graduate education and academia among their options upon graduation.
- Maintain open communication with alumnae and their employers to encourage their continued participation in and support of the Women in Engineering Program.



Women in Engineering Program

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## *ABOUT THE GRADUATE WOMEN IN ENGINEERING NETWORK (GWEN)*

### **Mission**

To provide strategies within a supportive community for women engineering graduate students to advance personally, academically, and professionally.

### **Objectives**

**COMMUNITY** | To establish an inclusive network that affirms, inspires, and supports women and gender minorities throughout their engineering graduate career.

**STRATEGIES** | To provide opportunities to develop skills and introduce strategies for professional and personal development.

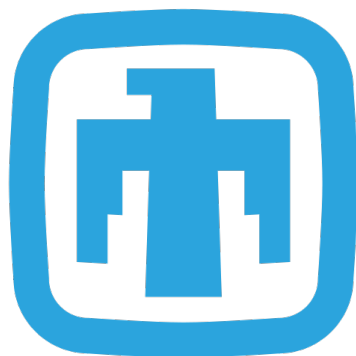
**ADVANCEMENT** | To provide an enriching experience that encourages individual growth, and furthers the community of women engineers.

**Thank you to WiE Program Associate Director Dr. Suzanne Zurn-Birkhimer, WiE Program Admin Assistant Cathy Deno, and the 2022-2023 GWEN Leadership Team Anne Serban, Burla Ondes, Elizabeth Sanders, and Olivia Brandt for organizing this event!**



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**Sandia  
National  
Laboratories**

Thank you to Sandia National Labs for their support to make this event possible!

# SYMPOSIUM BINGO

\* You must complete one row of four boxes containing only one of the gold squares to win the prize!

Attend two non-traditional talks: 1. _____ 2. _____	Write one question you have for the the keynote speaker:	Share a photo on social media/LinkedIn with #GWENSymposium.	View three posters outside of your discipline: 1. _____ 2. _____ 3. _____
Write the name of someone you share research interests with: _____	Network 1:1 with an alumna.	Attend three presentations outside of your discipline: 1. _____ 2. _____ 3. _____	Ask an alumna a question during one of the Sessions.
Follow 3 new people on LinkedIn.	View three posters outside of your discipline: 1. _____ 2. _____ 3. _____	Find someone with the same undergraduate degree as you.	Attend two non-traditional talks: 1. _____ 2. _____
Attend three presentations outside of your discipline: 1. _____ 2. _____ 3. _____	Attend two non-traditional talks: 1. _____ 2. _____	Write one new research question you have:	Take a professional head shot.



**PURDUE**  
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Women in Engineering Program

## Women in Engineering Program

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