

JUMP into STEM

Professor Team Webinar #1

(New Professors)

April 20, 2023

Yeonjin Bae, ORNL
Kim Trenbath, NREL

Today's Agenda



- JUMP into STEM Overview
- JUMP into STEM Competition
- 2023-2024 Professor Team
- 2022-2023 Competition
- Q&A

Management Team



U.S. Department of Energy (DOE) Building Technologies Office (BTO)



Nicholas Ryan



Sven Mumme

Oak Ridge National Laboratory Grid Interactive Controls, Integrated Building Performance



Dr. Yeonjin Bae



Bill Eckman



Dr. Mini Malhotra



Dr. Yeobeom Yoon



Jason Schmidt

National Renewable Energy Laboratory Building Technologies and Science Center



Dr. Kim Trenbath



Dr. Kerry Rippy



Allison Georgeson



Lindsey McGuirk



Salem Haile

Pacific Northwest National Laboratory Building Simulation & Design, Building Systems



Dr. Sarah Newman



Carmen Cejudo

JUMP into STEM Overview



- BTO-sponsored building science collegiate competition
- Student teams respond to one of three challenges
- Promotes ideation and diversity
- Awards include mentoring and paid internships
- 2023-2024 is sixth year of student competition

For more info:
www.jumpintostem.org

Vision



- Inspire the next generation of building scientists, focusing on creative ideation and diversity in the building science field
- Provide a gateway for college undergraduate and graduate students to experience the research and career possibilities of studying building science
- Attract students from diverse majors and diverse backgrounds



Advisory Board



Dr. Lina Patino
*National Science
Foundation*
Office of the Assistant
Director for Geosciences



Dr. Moody Altamimi
ORNL
Office of Research
Excellence



Dr. Ellen Morris
*National Renewable
Energy Laboratory*
University Partnerships



Dr. Desmond Stubbs
*Oak Ridge Associated
Universities*
Diversity Initiatives



Dr. Mary Bollash
Carrier
Engineering Learning
& Development

JUMP into STEM Competition

Tentative Student Competitions for Building Technology Innovation



3 concurrent online challenges
August-November

Final competition
at ORNL or NREL

Awards: Summer
Internships
(2024)

For more information,
visit jumpintostem.org

How it works:

- Fall semester: three building science challenges for innovation
- Supported with technical overview slide deck for each challenge
- Webinars
 - Professor team webinars
 - Student info sessions
- Finalists compete in Final Competition at ORNL or NREL for paid summer internships at ORNL, NREL or PNNL

JUMP into STEM Supporting Resources and Webinars



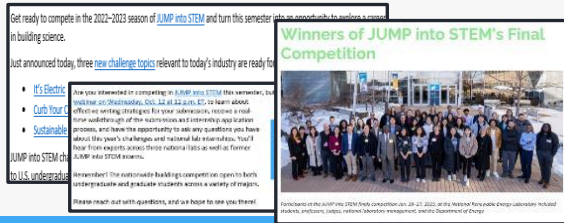
JUMP into STEM website

- Go-to location for students and professors
- www.jumpintostem.org



JUMP email (jump@ornl.gov)

- Challenge topic
- Webinar
- Winner announcement



Professor webinar

- 6-7 Professor team webinars
- Potential challenge topics
- Program updates



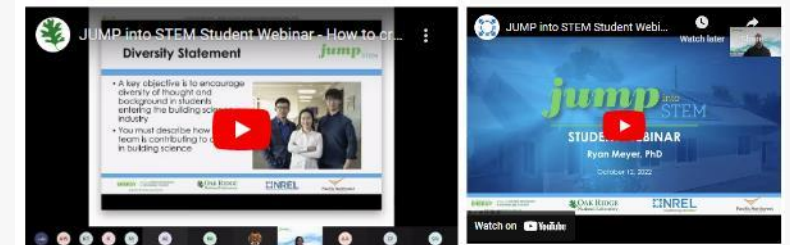
Professor Team recruiting video



Professor Team slides and flyer

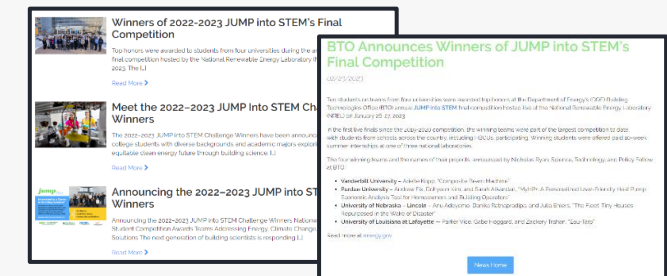
Student webinar

- Student webinars
 - How to create successful submission
 - JUMP into STEM Student Webinar



Share the recording

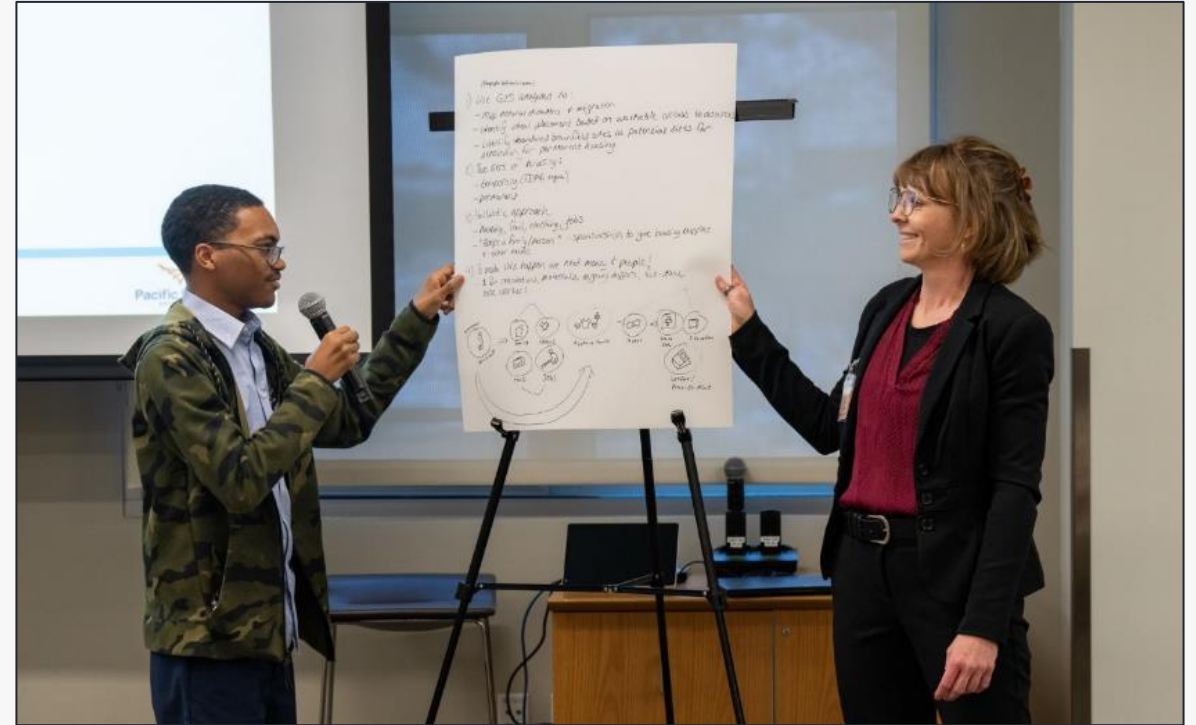
Share the JUMP into STEM news



Challenge Winners



- Each team chooses to participate in one of three Challenges
- Online resources help teams explore solutions and craft submissions
- Winning teams selected from each Challenge will be awarded a token of recognition and 1:1 mentorship with an industry expert



Challenge Finalists



- Challenge winners, and additional eligible teams will be selected to compete at the **Final Competition**
- Finalists will be notified in December
- To be eligible to participate in the Final Competition, students must complete Zintellect **internship applications**



Final Competition

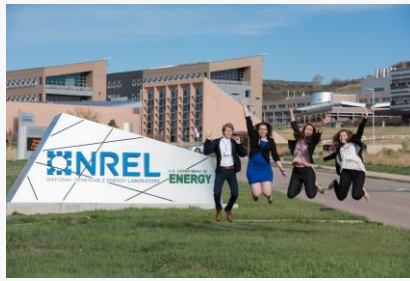


- The Final Competition will be held in person at ORNL (January, 2024)
- Finalists will present ideas to a panel of judges from industry, DOE, academia, and national labs

Winning Teams



- Will receive 10-week paid internship at ORNL, NREL, or PNNL



- Will be highlighted in DOE online article
- Interns will have dedicated mentors and work with national lab staff members



2023-2024 Professor Team

2023-2024 Professor Team



Join the JUMP into STEM Professor Team!

Your Role and Activities:

- The Professor Team connects DOE's goals within the Challenges to university students.
- Engage with JUMP into STEM team to provide feedback on potential challenges and updates during the competition
- Incorporate at least one (1) challenge into an appropriate Fall 2023 course as part of the student's grade
- Support students on research and submissions
- Promote JUMP into STEM to other university stakeholders.



JUMP into STEM participants Jarrett Thomas and Jai Huntley, and Hampton University Professor Laura Battaglia

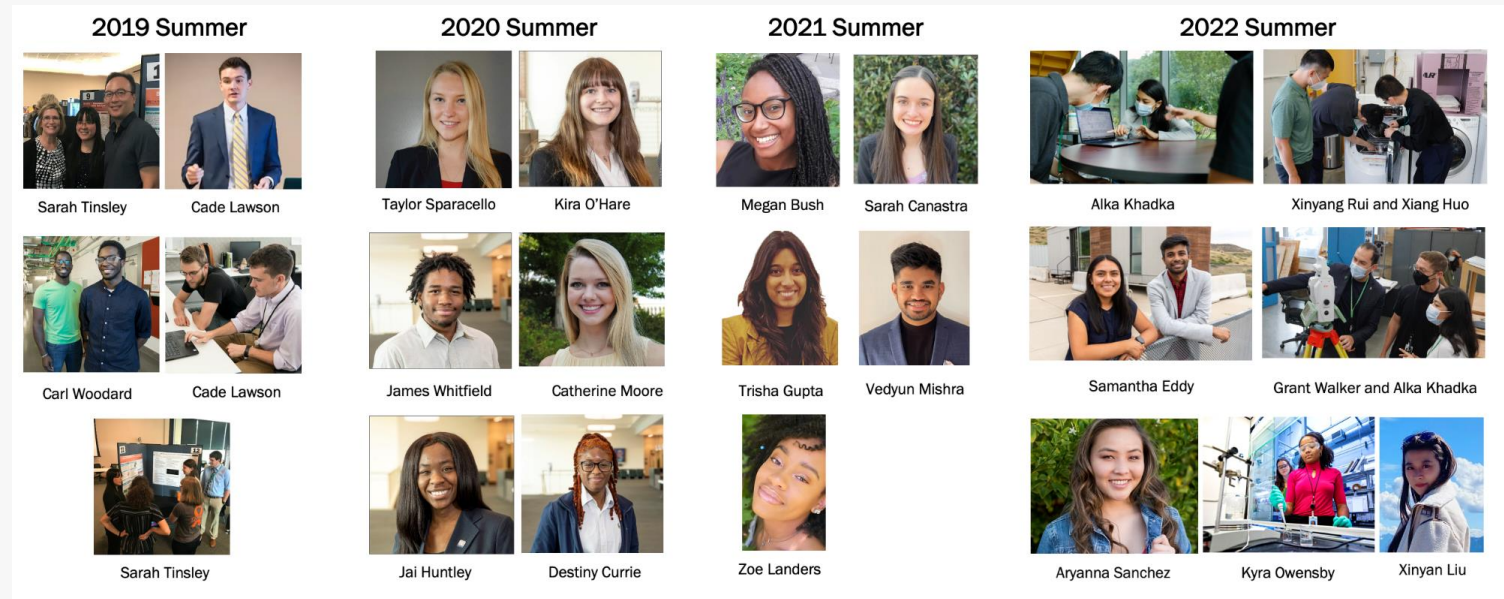
For more info:

<https://jumpintostem.org/professors/>

2022-2023 Professor Team (cont.) *jump* into STEM

Benefits to participating:

- Give your students the opportunity to earn a **10-week paid summer internship** to a national laboratory (ORNL, NREL, or Pacific Northwest National Laboratory).



- To date, 23 students have interned at ORNL, NREL, and PNNL.

2022-2023 Professor Team (cont.) *jump* into STEM

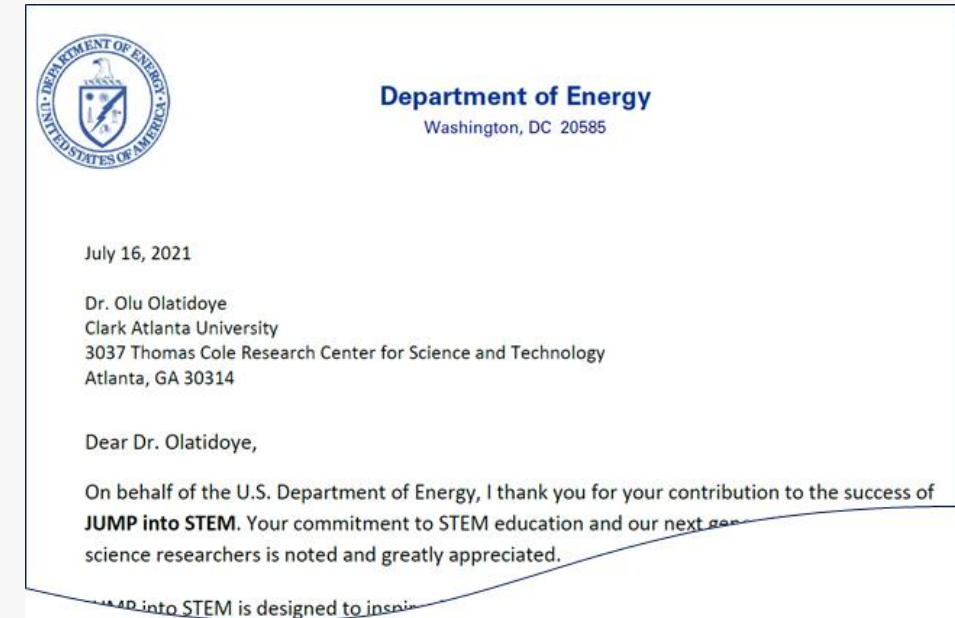
▪ Benefits to participating:

- Make connections with DOE and the national laboratories that can lead to additional scientific progress.
- Invited to attend the JUMP into STEM Final Competition
 - Results in teaching students about national labs and DOE.
 - Collaboration on proposals.



2022-2023 Professor Team (cont.) *jump* into STEM

- **Benefits to participating:**
- Meet service-related metrics for your university by contributing to the development of a nationwide student competition.
- Letter of Recognition
 - Recognizes participation
 - Official letter from U.S. Department of Energy's Building Technologies Office (BTO)
- Incorporate at least one (1) challenge into an appropriate Fall course as part of the student's grade **that leads to students' submissions**



2022-2023 Competition

2022–2023 Challenge Topics



It's Electric



Curb Your Carbon



Sustainable and Resilient

2023's Final Competition



22–23 Challenge Series Topics

- Curb Your Carbon
- It's Electric
- Sustainable and Resilient

Professor team

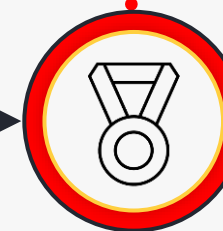
48 professors from
44 schools
12 professors from
10 MSIs

Submissions

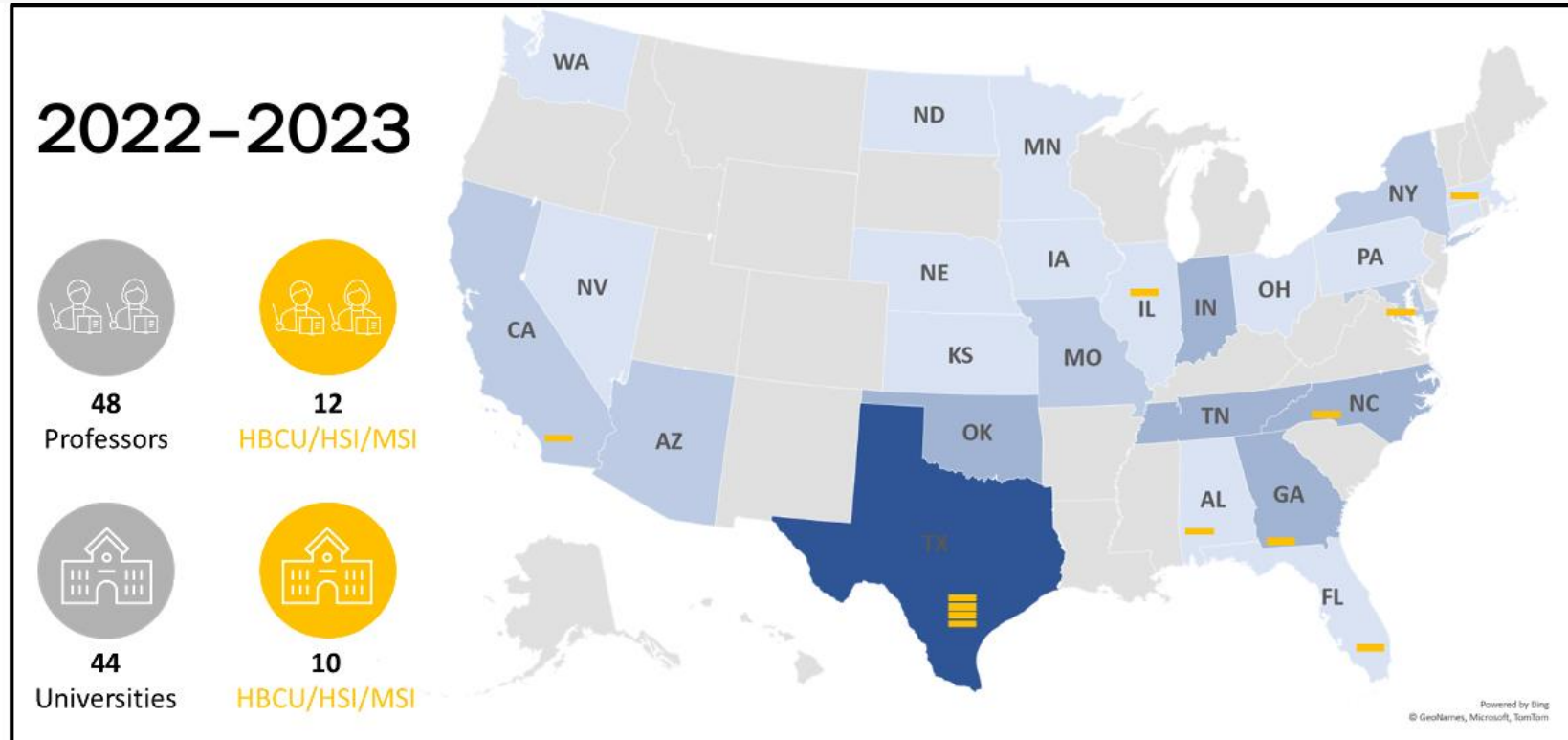
75 ideas
from **266** students

8

**FINALIST
TEAMS**

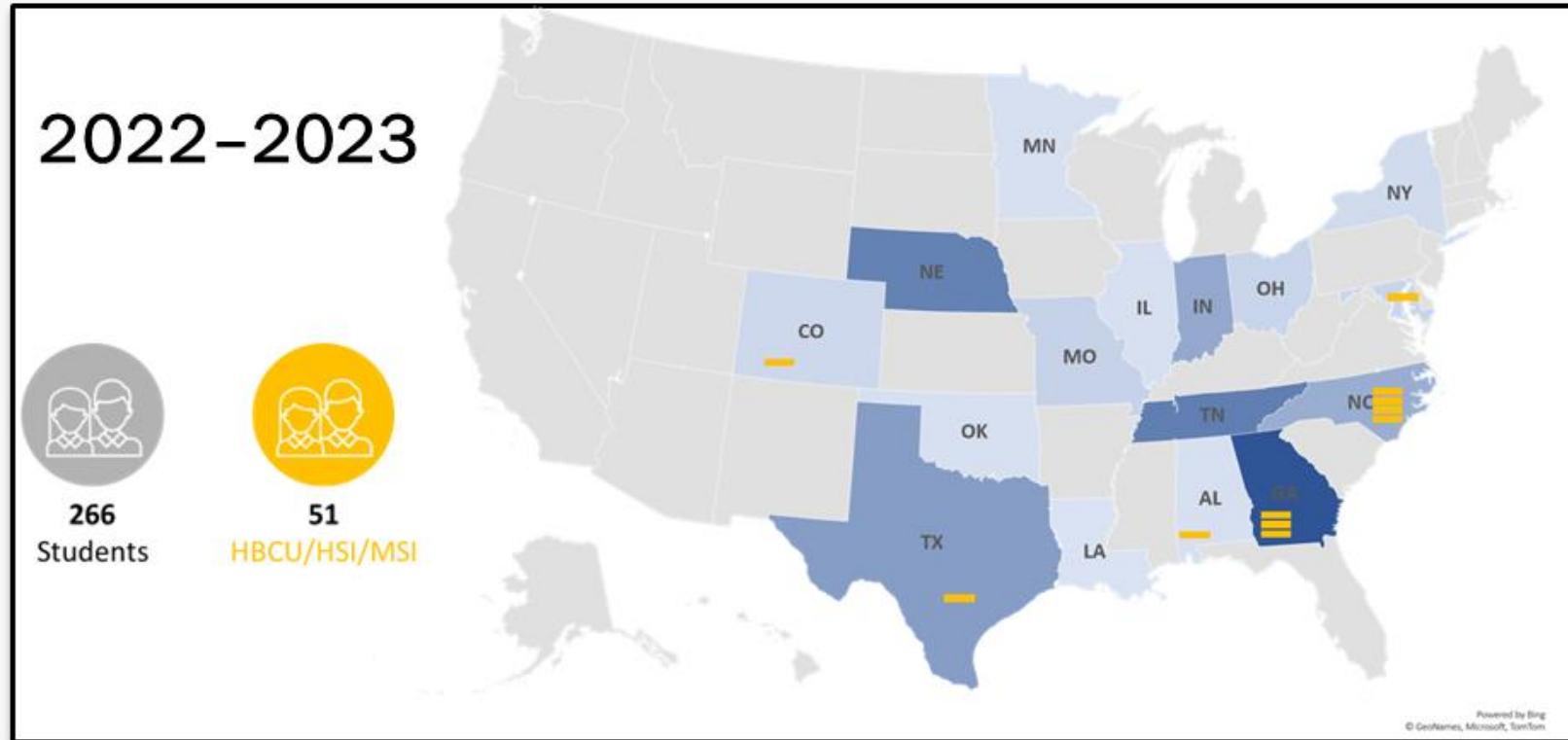


JUMP into STEM's Professor Team



— Professors from HBCU/HSI/MSI

JUMP into STEM's Student Participants



— Student participants from HBCU/HSI/MSI

2022-2023 Challenge Winners



■ Curb Your Carbon

- **Winner:** Composite Beam Machine
- **Runner-Up:** Carbon-Negative Building Materials: Building a Greener Tomorrow



■ It's Electric

- **Winner:** Upcycle Old Electric Vehicle Battery Modules for Backup Power Systems in Rural Areas or Areas with Uncertain Power Supply
- **Runner-Up:** Solar Savings Web Estimator

INDIANA **TECH**



■ Sustainable and Resilient

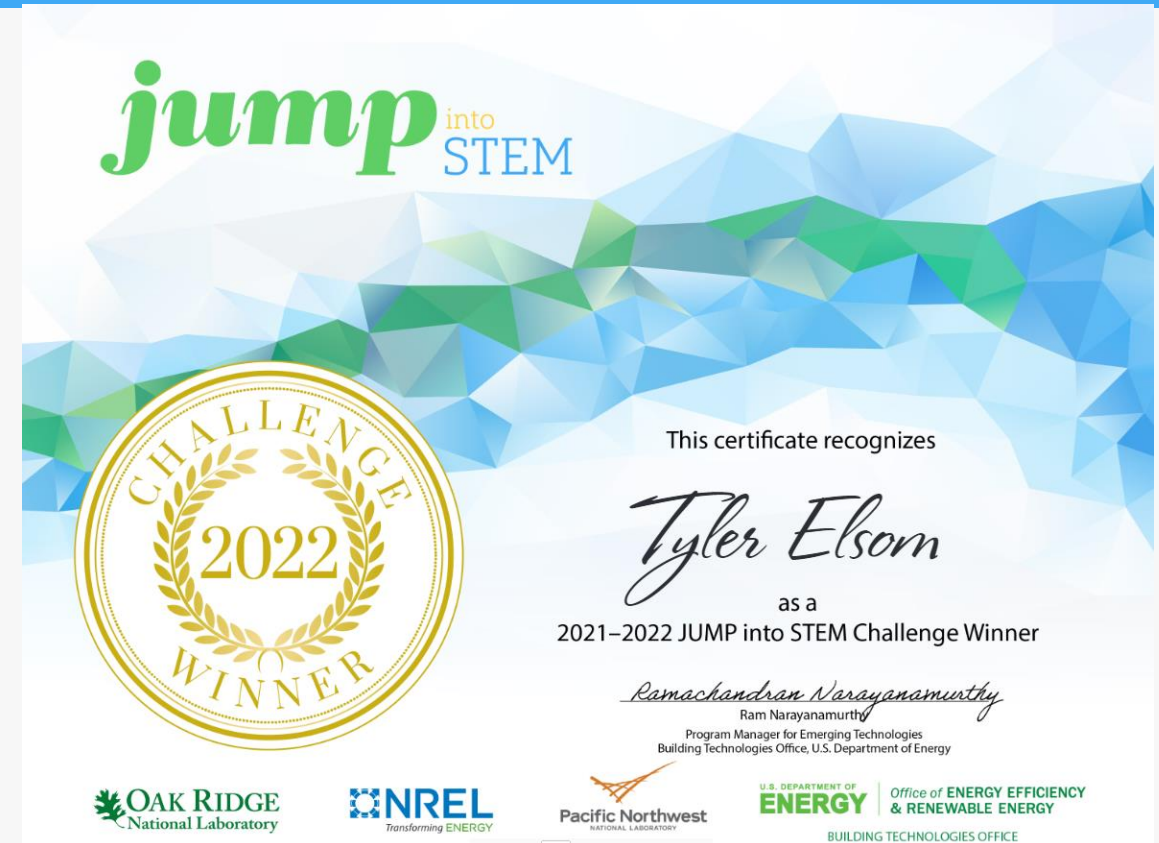
- **Winner:** An Inquiry into Rainwater Harvesting for the Supplementation of Water Infrastructure During Times of Crisis
- **Runner-Up:** Solar Success Loans for Baltimore Resilience and Sustainability



Challenge Awards



- ★ One hour of one-on-one mentoring with BTO, ORNL, NREL or PNNL staff
- ★ Certificate



2022-2023 Finalist



✦ Curb Your Carbon

- Investigation on Decarbonization Leveraging Strategy for the Underserved Communities in Chicago Area
- CO2 Photosynthesizer
- Composite Beam Machine
- Decreasing Carbon Concrete's Carbon Footprint

✦ It's Electric

- A Personalized User-Friendly Heat Pump Economic Analysis Tool for Homeowners and Building Operators

✦ Sustainable and Resilient

- The Fleet: Tiny Houses Repurposed in the Wake of Disaster
- Rainwater Advocacy and Information Non-profit (R.A.I.N.)
- Eau-Tarp



2023 Final Competition



Final Competition Winners

- **Vanderbilt University**, Arielle Kopp, "Composite Beam Machine"
- **Purdue University**, Andrew Fix, Dohyeon Kim, and Sarah Alkandari "MyHP+ A Personalized User-Friendly Heat Pump Economic Analysis Tool for Homeowners and Building Operators"
- **University of Nebraska**, Anu Adeyemo, Danika Ratnapradipa, and Julia Ehlers, "The Fleet: Tiny Houses Repurposed in the Wake of Disaster"
- **University of Louisiana at Lafayette**, Parker Vice, Gabe Hoggard, and Zackery Trahan, "Eau-Tarp"

JUMP into STEM Videos



- Check out latest videos of JUMP into STEM!



<https://jumpintostem.org/professors/>



<https://jumpintostem.org/final-event-jan-2023/>

JUMP into STEM Past Challenge Topics

JUMP into STEM Challenge Topics *jump* into STEM

For more info:

<https://jumpintostem.org/challenge-archive/>

2019–2020



Pushing the Envelope with Innovative Wall **Retrofit** Designs



Designing a Healthier and **Energy Efficient** Air Distribution System



Smart **Sensors and Controls** for Residential Buildings

2020–2021



Building Energy Audit for Residential/Commercial Buildings



Grid-Interactive Efficient Buildings



Advanced Building Construction Methods

2021–2022



Equal Access to **Healthy Indoor Air**



Resilience for All in the Wake of Disaster



Solving Market Adoption for Emerging Efficiency Technologies

2022–2023



It's **Electric**



Curb Your Carbon



Sustainable and Resilient

Next Steps



- Interested in joining the Professor Team?
- Please email me by **May 17** to let us know if you are interested in
 - Yeonjin Bae (baey@ornl.gov)
 - Fall courses that might include a JUMP into STEM challenge



Professors

- ✓ Offer a unique, in-class learning experience
- ✓ Help students earn a paid national lab internship
- ✓ Introduce the next generation to building science

jumpintostem.org/professors



Next Meeting



Professor Team introductory Webinar for **NEW** professor team members

- April 20, 2-3 pm (EST)
- May 3, 12-1 pm (EST)

Professor Team Webinar for **ALL** professors

- Will be scheduled for mid-May
- Potential challenge topics
- Program updates

Thank you!

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Questions?



Q&A