



# SFPE Foundation Programs, Progress, and Updates

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6th Fire and Evacuation Modeling Technical Conference

Brno, Czech Republic

September 14, 2022

# Agenda

About SFPE

The SFPE Foundation

Research Support

Awards & Scholarships

New Initiatives

Getting Involved

Contact Information, Q&A

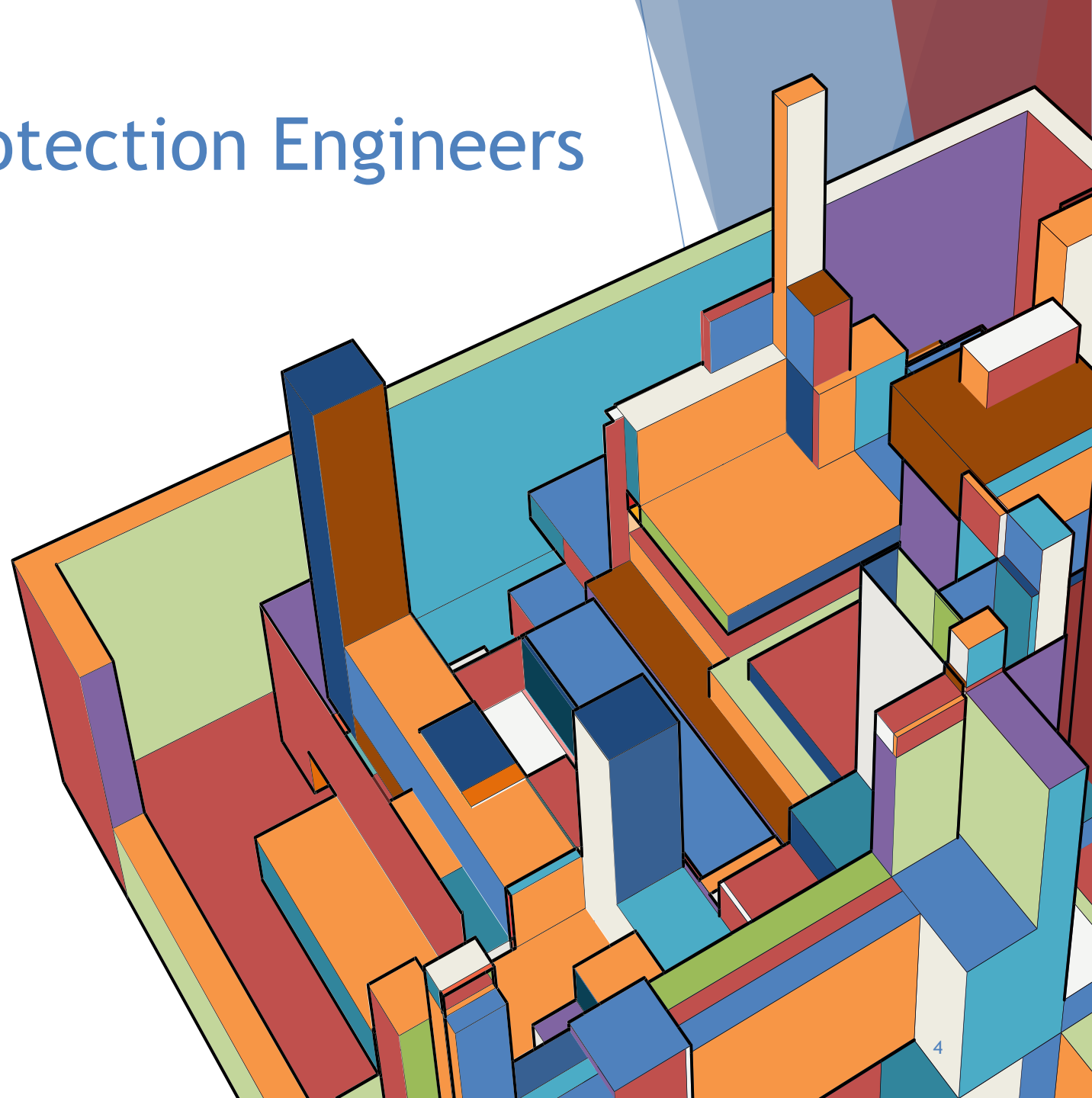
# About SFPE

# SFPE: Society of Fire Protection Engineers

- ▶ *Engineering a fire-safe world since 1950*
- ▶ Headquartered near Washington, DC, and in Brussels, BE
- ▶ SFPE is the world's leading professional society for fire protection and fire safety engineering
- ▶ 4,800+ members globally
- ▶ 120+ SFPE chapters globally



Visit us at  
[sfpe.org](http://sfpe.org)



# Key Offerings

## MEMBERSHIP

- ▶ The resources you need to excel in your career, stay on top of the latest industry developments and research, and connect with the sharpest minds.

## STANDARDS & GUIDES

- ▶ As an ANSI-accredited standards developer, SFPE publishes standards, guides, handbooks, and other resources to advance engineering best practices.

## EVENTS

- ▶ Annual Conference and Expo, conferences, and symposia to deliver and develop top practices.

## EDUCATION

- ▶ Live virtual education, live in-person education, and on-demand virtual education to help you excel.

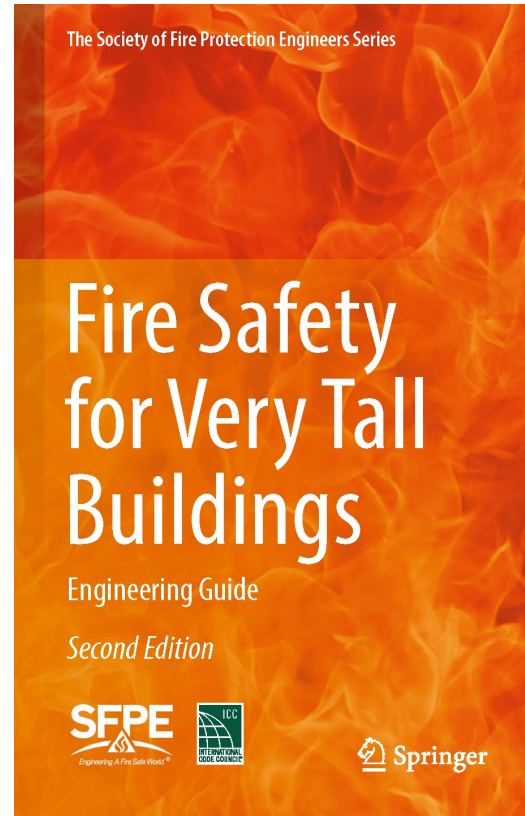
## PERIODICALS

- ▶ FPE magazine, FPEeXTRA, Fire Technology Journal, digital news briefs, and more to keep you connected with the information you need.

## CAREER RESOURCES

- ▶ Resources for students entering the workforce, professionals seeking new opportunities, and employers looking for candidates.

# Select SFPE Highlights



- ▶ SFPE Annual Conference & Expo
- ▶ SFPE European Conference
  
- ▶ Virtual, in-person, & on-demand education tailored to the needs of fire protection and fire safety engineering professionals
  
- ▶ Guides and handbooks

# The SFPE Foundation

# Mission & Vision

- ▶ Established by the Society of Fire Protection Engineers as the SFPE Educational and Scientific Foundation in 1979

## Mission:

- ▶ *Enhance the scientific understanding of fire and its interaction with the natural and built environments.*

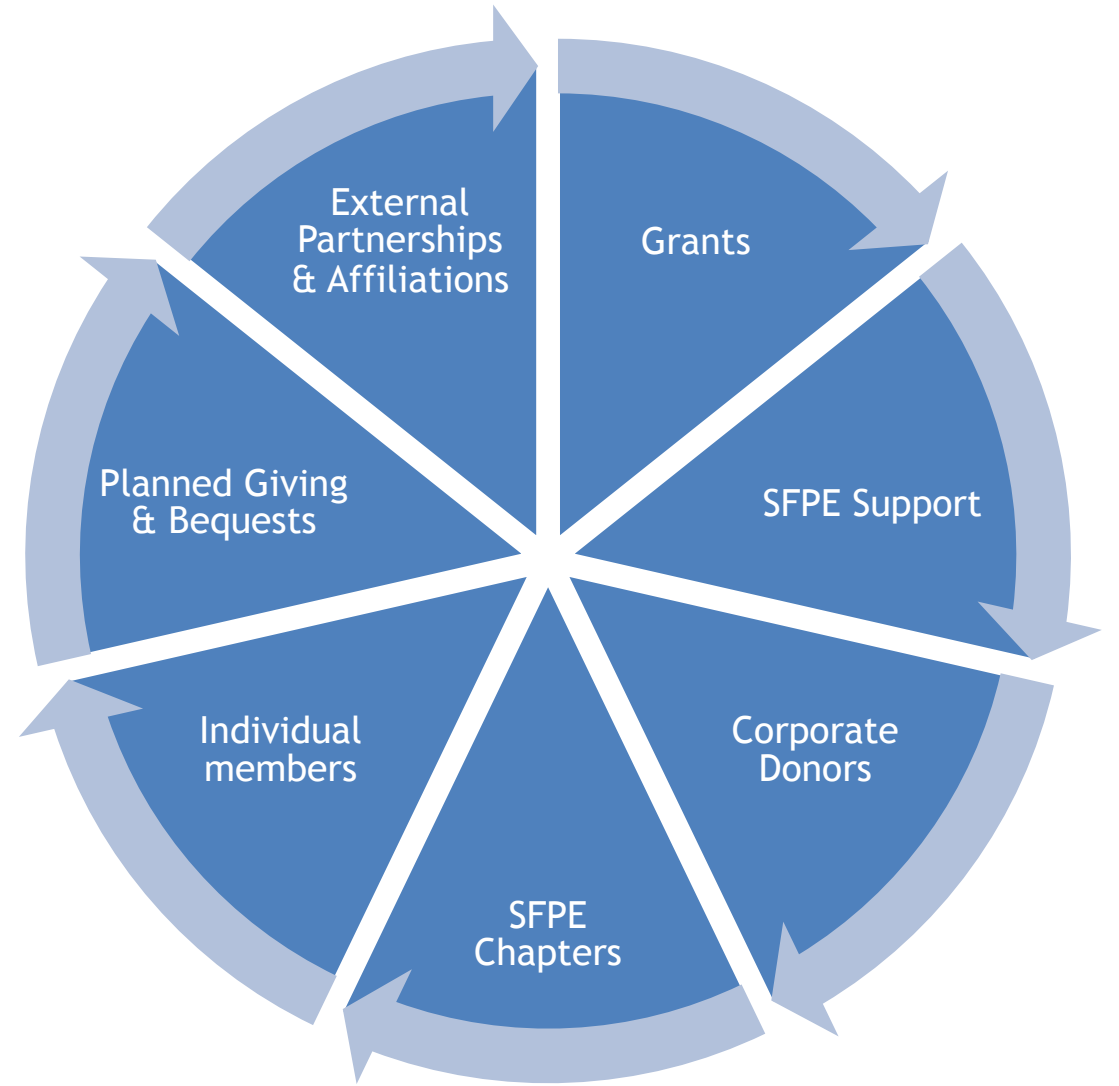
## Vision:

- ▶ Facilitate scientific and engineering *research* focused on fire risk, safety, mitigation, control, and human response.
- ▶ Facilitate the development of *engineering methods* to mitigate the adverse consequences of unwanted fires.
- ▶ Provide *education* and research opportunities for the next generation of fire protection engineers.



# Our resources

- ▶ Shared resources and support from SFPE
- ▶ External partnerships & grants
  - ▶ FEMA FP&S Grant
- ▶ Donations



# Our work

- ▶ SFPE Research Roadmap
- ▶ Research project development
- ▶ Proposal writing & administration
- ▶ Education and outreach
- ▶ Cross-sectoral collaborations
- ▶ Grantmaking
- ▶ Scholarships
- ▶ Awards

## Research Needs for the Fire Safety Engineering Profession

	TOOL, APPLICATIONS, & METHODS				
	Data	Innovative Technology /Materials	Design Tools	Risk /Probabilistic Approaches	
THREADS	Human Behavior	✓	✓	✓	✓
	Building Fires	✓	✓	✓	✓
	Resilience/Sustainability	✓	✓	✓	✓
	Fire Service	✓	✓	✓	✓
	Fire Dynamics	✓	✓	✓	✓
	Fire Safety Systems	✓	✓	✓	✓
	Forensics/Investigations	✓	✓	✓	✓
	Wildland/WUI Fires	✓	✓	✓	✓
	Non-Building Fires	✓	✓	✓	✓

# Research Support

# 2020-21 Select Funded Research Projects

## Anthropometric Data and Movement Speeds

- York University, Canada
- **Research Goal:** to compile and organize contemporary, project specific, movement speeds from existing published and unpublished data sets from industry and academic partners globally, with special considerations for accessibility, upwards/downwards movement, etc. Complete.
- **RR Threads:** Human Behavior

## Using Biomechanical Data to Determine Evacuation Capability

- Lund University, Sweden
- **Research Goal:** to reflect demographic changes in society through the development of a prototype model to predict movement of persons based on age, height, gender and response time to adapt the walking speed in a crowd. Complete.
- **RR Threads:** Human Behavior

# 2021-22 Funded Research Projects

## Water Supply and Climate Change: The Impact of Water Stress on Fire Protection Systems

- Oklahoma State University, USA
- **Research Goal:** understand how fire protection and water supply systems design should adapt to a changing climate, specifically water scarcity or stress that impacts the reliability of systems; identify whether codes, standards, or public policy changes may be needed. Publication pending.
- **RR Threads:** Fire Safety Systems + Resilience/Sustainability

## Environmental and Health Impacts of Fire and Fire-Suppression Activities During Large-Scale Fire Events

- FireTox, LLC., USA
- **Research Goal:** characterize the environmental and health impacts following large-scale wildland and structural fire events; including a literature review, current systems for monitoring, and gaps analysis. Expected Q4 2022.
- **RR Threads:** Wildland/WUI Fires, Resilience/Sustainability, Innovative Tech/Materials

- Announcing two additional large grant recipients by end of 2022



# Student Research Grants



Any student researching fire protection or fire safety engineering topics may apply



6-8 awards per year, \$5,000 per awardee



Evaluated on technical merit, usefulness, qualifications, achievability



Applications due in May and November annually



# May 2022 Student Research Grants Awarded (\$5,000 USD)

Next cycle of applications due: **November 1, 2022**

▶ **Rocio Cortez:**

“Integrating Wildlife Rescue and Rehabilitation into Disaster Loss Reduction Planning”

▶ **Andrea Franchini:**

“A Novel Risk-Based Fire Design Method for Sustainable Structures”

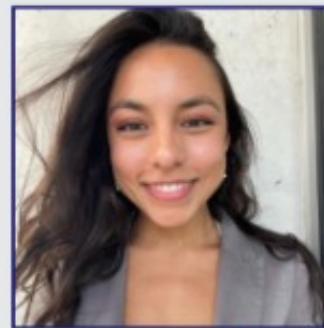
▶ **Marika du Plessis:**

“Experimental and Numerical Testing of Mass Timber Connections Considering Gap Size and Passive Protection”

▶ **Zilong Wang:**

“Smart Fire Calorimetry Driven by Image Analysis and Artificial Intelligence”

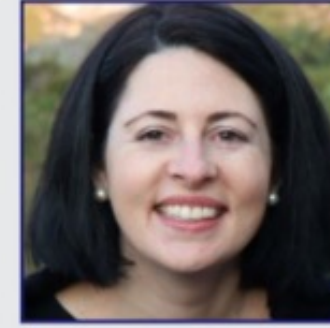
## May 2022 Student Research Grants



Rocio Cortez,  
Masters Student,  
Texas State  
University (USA)



Andrea Franchini,  
Ph.D. Student,  
University College  
London (UK)



Marika du Plessis,  
Ph.D. Student,  
University of  
Stellenbosch (South  
Africa)



Zilong Wang, Ph.D.  
Candidate, The Hong  
Kong Polytechnic  
University (Hong  
Kong)



# New “Research Impact” Page on Website

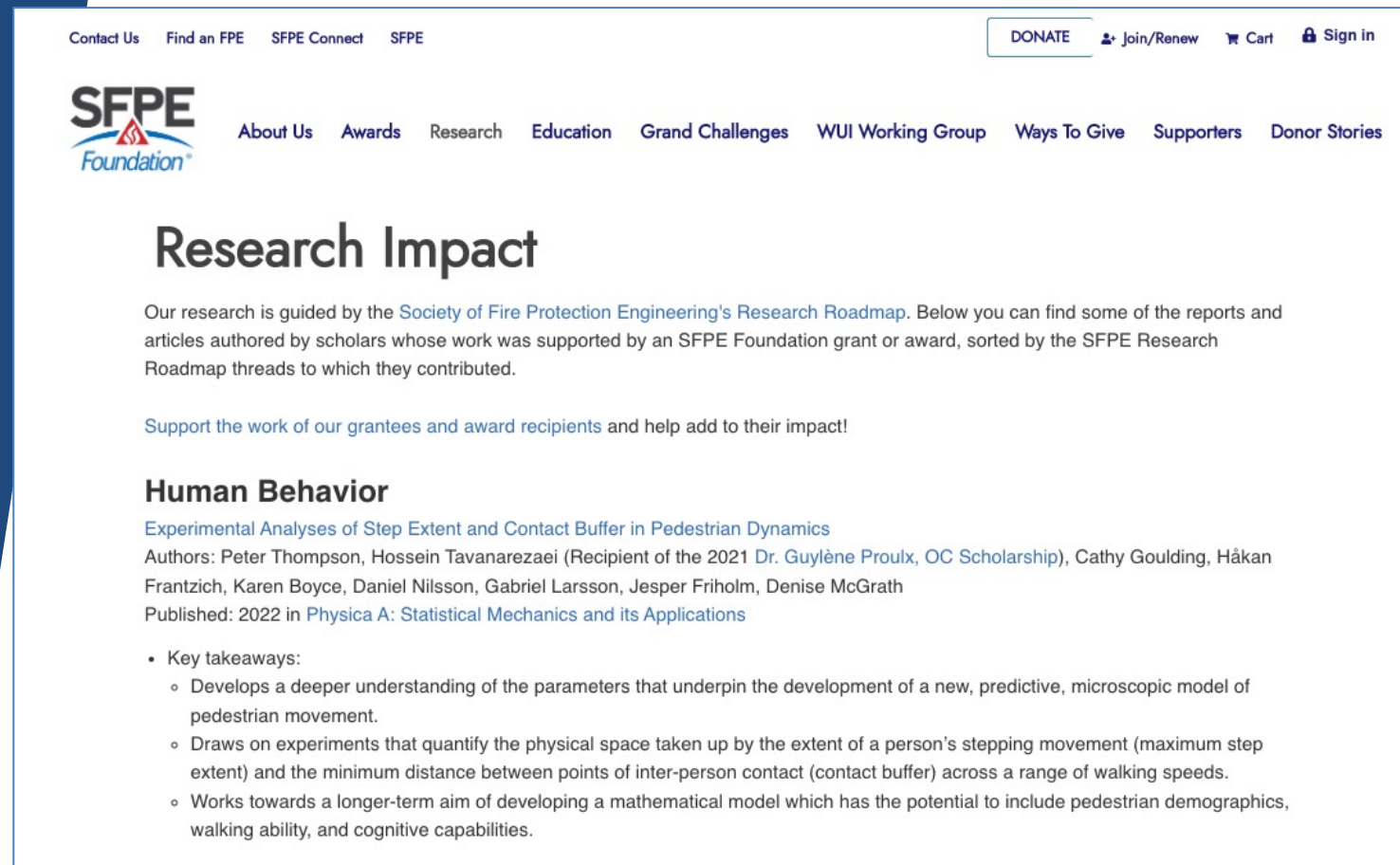
## ▶ Visit:

<https://www.sfpe.org/foundation/foundationresearch/impact>

## ▶ All research projects since 2020 mapped to SFPE Research Roadmap; links to published journal articles, reports, webinars, and more

## ▶ Example:

- ▶ One 2020 Student Research Grant (\$5k) winner’s project turned into 4 peer-reviewed journal article publications and contributed to gaps in 4 Research Roadmap areas!



# New Webinar Series: *Research in Fire Engineering*



- ▶ Open access - no fee to view; earn PDH credit!
- ▶ Widely disseminate new, innovative research
- ▶ Presentations feature projects funded by the SFPE Foundation or completed by Academic Leadership Council (ALC) members

## Examples:

- ▶ **“Development of Fire Engineering Practitioner Tools Report”**
  - ▶ Fire Research Group & University of Canterbury (NZ)
  - ▶ SFPE Foundation-funded project
- ▶ **“Design Fire and Materials Database Project”**
  - ▶ University of Maryland, Poole Fire Protection, and Performance-Based Fire Protection Engineering
  - ▶ SFPE Foundation-funded project
- ▶ **“Experimental and Numerical Investigation of Gypsum Calcination under Fire Exposure”**
  - ▶ ALC Member Presentation: Eastern Kentucky University

# Awards & Scholarships

# 2022 Foundation Awards

- ▶ **Dr. Guylène Proulx, OC Scholarship** - Recognizes a student researching in the field of human factors or human behavior related to fire, emergencies, or integration in fire protection engineering -- **\$5,000 USD**
  - ▶ 2022 Awardee - how exit choice is influenced by the presence of people with mobility limitations

**Erik Smedberg, Ph.D. student  
Lund University, Sweden**





# 2022 Foundation Awards



- ▶ **Frederick W. Mowrer Global Scholar Award** - Supports students from emerging nations studying fire safety science and engineering (or a related discipline) at a post-secondary institution in a developing nation -- \$1,000 USD
  - ▶ 2022 Awardee - for the study of peat smoldering combustion and suppression methods using an integrated experimental rig at laboratory-scale

**Hafizha Mulyasih, Universitas Indonesia, Indonesia**



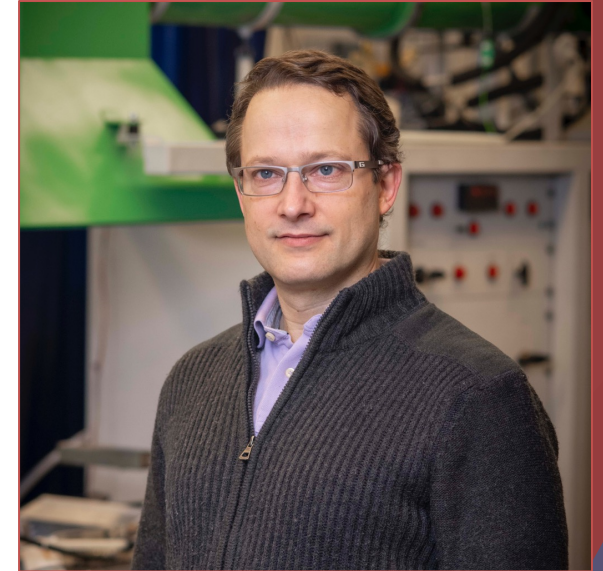
- ▶ **Student Scholar Award** - Recognizes high-performing students who are conducting research to advance the science and practice of fire protection engineering -- \$1,000 USD
  - ▶ 2022 Awardee - Fire simulation assessment of residential compartment fire scenarios

**Iffah Umairah Zulmajdi, Universiti Putri Malaysia, Malaysia**

# 2022 Foundation Awards

- ▶ **The Arthur B. Guise Medal** - Recognizes eminent achievement in the advancement of the science and technology of fire protection engineering -- \$2,000 USD
  - ▶ 2022 Awardee - for instrumental work in advancing the research and understanding of wildfires (including FPE applications) on an international level

**Dr. Albert Simeoni, Worcester Polytechnic Institute, USA**



- ▶ **Jack Bono Award for Engineering Communication** - Recognizes the author(s) of the paper published in the SFPE Journal (*Fire Technology*) during the prior year that has most contributed to the advancement and application of professional fire protection engineering -- \$2,000 USD
  - ▶ 2022 Awardee: “Fire Hazard Analysis of Modern Vehicles in Parking Facilities”

**Haavard Boehmer, Michael S. Klassen, & Stephen M. Olenick, USA**

# New Initiatives

# WUI Working Group & Symposium

- ▶ Identify the role fire engineering can play in addressing fire and related hazards in the Wildland-Urban Interface (WUI)
- ▶ Identify practical tools, approaches, resources available now; raise awareness, understand context
- ▶ Identify where resources could have the most impact
- ▶ Build a foundation for investment in research, training, certification, partnership-building, and more

*\*Planning for virtual WUI Symposium Jan. 25-26, 2023*





# WUI Working Group & Symposium

- ▶ Co-chaired by Albert Simeoni (WPI, USA) & Alex Maranghides (NIST, USA)
- ▶ **Mod 1: Individual Asset Protection**
  - ▶ Pascale Vacca & Elsa Pastor, CERTEC (Spain)
  - ▶ Pedro Reszka, Universidad Adolfo Ibáñez, (Chile)
- ▶ **Mod 2: Community Notification & Evacuation**
  - ▶ George Braga, Federal District FD (Brazil)
  - ▶ Max Kinateder, NRC (Canada)
- ▶ **Mod 3: Community Wildland Fire Protection**
  - ▶ Domingos Viegas, University of Coimbra (Portugal)
  - ▶ Dee Withee, Colorado Springs FD (USA)

# FEMA FP&S Grant FY2020

## “Beyond the Checklist: A Virtual Handbook for WUI Property Fire Risk Assessment and Mitigation”

- ▶ Putting engineering-based resources into the hands of fire departments operating in the WUI
- ▶ Project Advisory Panel includes reps from SFPE Fire Service Subcommittee
- ▶ Jensen Hughes selected as Technical Consultant, team led by Darlene Rini, P.E.
- ▶ Virtual workshop held Dec. 2021
- ▶ Piloting and tool development in June 2022
- ▶ Launching tool with live demonstration at SFPE Annual Conference & Expo in Detroit on Oct. 14







# Grand Challenges Initiative

- ▶ Three-year initiative to develop a strategic roadmap for the field (2022-2024)
- ▶ Through the lens of global “grand challenge” topics:
  - ▶ Energy & Infrastructure
  - ▶ Resilience & Sustainability
  - ▶ Climate Change
  - ▶ Digitalization, AI, & Cybersecurity
- ▶ *What’s the role of fire engineering in solving these grand challenges?*
- ▶ Virtual kick-off held April 26-28, 2022: “Grand Challenges Summit”



# Grand Challenges Initiative

- ▶ Formed Working Groups for each topic area
- ▶ Dedicated Breakout Track at SFPE Annual Conference & Expo in Oct. 2022
- ▶ White papers in each topic area published mid-2023
- ▶ Engaging students with new GCI Student Research Fellowship positions (\$5,000 each) supporting each topic area
- ▶ Collaborative workshop sessions for GCI Founding Partners 2023-2024





SFPE FOUNDATION

**Grand Challenges Initiative**

Virtual Summit | April 26-28, 2022

**SFPE**  
Foundation

## Introducing the GCI Student Research Fellows



**DR. ENRICO DANZI**

*Energy & Infrastructure*



**DR. NATALIA FLORES QUIROZ**

*Resilience & Sustainability*



**DR. ANKIT SHARMA**

*Climate Change*



**TIANHANG ZHANG**

*Digitalization, Artificial  
Intelligence, & Cybersecurity*



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SFPE FOUNDATION



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# Grand Challenges Initiative 2022-2024

## Founding Partners

- ▶ Corporates & non-profits (14):
  - ▶ Fire Safety Research Institute
  - ▶ HGI
  - ▶ Jensen Hughes
  - ▶ FM Global
  - ▶ National Ready Mix Concrete Association
  - ▶ SGH
  - ▶ Telgian Engineering & Consulting
  - ▶ Senez Consulting
  - ▶ Fire Protection Research Foundation
  - ▶ LMDG
  - ▶ Fisher Engineering
  - ▶ Thornton Tomasetti
  - ▶ Performance-Based Fire Protection Engineering
  - ▶ US Resiliency Council
- ▶ Academic/Research Partners (16):
  - ▶ Worcester Polytechnic Institute (USA)
  - ▶ University of Maryland (USA)
  - ▶ Oklahoma State University (USA)
  - ▶ Stellenbosch University (South Africa)
  - ▶ Western Sydney University (Australia)
  - ▶ ZAG (Slovenia)
  - ▶ University of Waterloo (Canada)
  - ▶ Cal Poly (USA)
  - ▶ Ghent University (Belgium)
  - ▶ RMIT University (Australia)
  - ▶ Lodz University & WIPOS (Poland)
  - ▶ University of Tennessee (USA)
  - ▶ University of Canterbury (New Zealand)
  - ▶ Imperial College London HazeLab (UK)
  - ▶ National Research Council Canada (Canada)
  - ▶ Sandia National Laboratories (USA)

# Academic Leadership Council

- ▶ Members include 30+ depts globally
- ▶ Meets 2 times per year; email comms monthly
- ▶ Enhancing visibility for academic partners and programs
- ▶ Sharing grant and funding opportunities, building relationships, advertising awards and scholarships
- ▶ Engaging faculty in research and education partnership discussions
- ▶ Identifying speakers and subject matter experts; highlighting programmatic strengths
- ▶ Collecting data on program graduates to support the field with recruitment, retention, development, etc.

# Getting Involved



# Getting Involved

- ▶ Sign up for the Foundation's **monthly e-news brief**; send us content suggestions
- ▶ Follow us on **LinkedIn** and **Twitter**
- ▶ **Share** our award, scholarship, and grant opportunities with your networks; apply!!
- ▶ Watch one of our **free recorded webinars** through the *Research in Fire Engineering Webinar Series* (up to 6 PDH for FREE)
- ▶ Join the Foundation's **Academic Leadership Council**, **Grand Challenges Initiative**, or **WUI Working Group Initiative**
  
- ▶ **Donate** to support our work:
  - ▶ Annual Campaign
  - ▶ Fitzgerald Matching Fund Challenge
  - ▶ Student Travel Fund
  - ▶ Leave a gift to the Foundation in your will; join the Legacy Society
  
- ▶ Let us know: How can we work together?

# Contact Information

# Contact us

<https://www.sfpe.org/foundation/home>

 <https://twitter.com/SFPEFoundation>

 <https://www.linkedin.com/company/sfpefoundation>



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