Post Doctoral Fellow (WUI Fire Emissions, Experiments, and Multiscale Modeling)

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JOB TITLE
Post Doctoral Fellow (WUI Fire Emissions, Experiments, and Multiscale Modeling)

LOCATION
Worcester

DEPARTMENT NAME
Civil, Environmental, & Architectural Engineering - NFR JM

DIVISION NAME
Worcester Polytechnic Institute - WPI

JOB DESCRIPTION SUMMARY
The research group at Worcester Polytechnic Institute is seeking a postdoctoral researcher to contribute to an interdisciplinary project on wildland-urban interface (WUI) fire emissions from building materials and scaled residential structures. The primary focus of the position is to support the current project through a combination of experiments, data analysis, and modeling. The project examines how fire behavior influences aerosol and gas emissions, whether emissions from complex building assemblies can be predicted from their individual materials, and how fire behavior and emission characteristics change across experimental scales. The position is intended for a researcher who can contribute strongly to the current project while developing broader expertise in multiscale wildfire-smoke research.

• PRIMARY FOCUS: Current WUI fire-emissions project funded by NSF: scaled house construction, multiscale experiments, data analysis, and model-supported interpretation.

• GROWTH DIRECTION: Extend project findings toward multiscale wildfire-smoke modeling, smoke transport, and interactions with the built environment.

JOB DESCRIPTION

Research Responsibilities

• Contribute to the planning, execution, and analysis of medium- and large-scale WUI fire experiments at WPI using building materials and scaled residential building models.
• Analyze integrated fire-behavior and emission datasets, including temperature, heat flux, flow/velocity, combustion indicators, and aerosol/gas measurements collected with project collaborators.
• Evaluate fire behavior-emission relationships, emission additivity, and scale dependence across bench-, medium-, and large-scale experiments, with attention to uncertainty and reproducibility.
• Develop or apply computational models that help interpret the experiments and investigate transfer of information across scales. Depending on expertise, this may involve fire/smoke CFD, reduced-order or physics informed models, urban dispersion tools, or multiscale model coupling.
• Prepare peer-reviewed manuscripts and conference presentations, collaborate with graduate students and project partners, and contribute to proposal development and preliminary studies related to future wildfire smoke research.

Qualifications

Applicants should hold a PhD in mechanical engineering, architectural/building engineering, fire protection engineering, civil/environmental engineering, chemical engineering, atmospheric science, or a closely related field.

Strong candidates will demonstrate:
• Research experience in fire, smoke, thermal-fluid sciences, pollutant transport, or a closely related area.
• A strong foundation in heat and mass transfer, fluid mechanics, combustion, or environmental transport, together with scientific programming and quantitative data-analysis skills.
• Experience with experimental research or experimental datasets; candidates who combine computational modeling with hands-on experimental experience are especially encouraged.
• A peer-reviewed publication record and the ability to carry research from analysis and interpretation through manuscript preparation.

Additional Relevant Experience

Experience with medium- or large-scale fire experiments, aerosol/gas measurements, building-material combustion, model validation, uncertainty quantification, high-performance computing, or tools such as FDS/WFDS, QUIC-Fire/QUIC-SMOKE, FIRETEC, or related fire/dispersion models is desirable but not required.

Application

To apply, please include
- A current Curriculum Vitae (CV)
- One representative peer-reviewed publication that best reflects the candidate's research experience and is closely aligned with the research direction of this position

Inquires should be sent to Dr. Shichao Liu at sliu8@wpi.edu: Please use the subject line "Postdoctoral Applicant – WUI Fire Smoke".

Applications will be reviewed on a rolling basis until the position is filled.

Compensation

Salary: $55,000.00 per year. Salary is based on related experience, expertise, and internal equity. WPI's benefits package includes a robust retirement match, wellness perks, tuition assistance and more!

FLSA STATUS
United States of America (Exempt)

WPI is an Equal Opportunity Employer. All qualified candidates will receive consideration for employment without regard to race, color, age, religion, sex, sexual orientation, gender identity, national origin, veteran status, or disability. It seeks individuals from all backgrounds and experiences who will contribute to a culture of creativity, collaboration, inclusion, problem solving, innovation, high performance, and change making. It is committed to maintaining a campus environment free of harassment and discrimination.

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About WPI

WPI is a dynamic, inclusive community of faculty, staff, and students committed to collaboration that sparks innovation to benefit the world. With competitive and comprehensive benefits—including health insurance, retirement, tuition assistance, work-life balance—and a culture that fosters growth, WPI empowers employees to thrive personally and professionally.

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