

Claire Strebinger

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Profile

Mechanical engineer with teaching and industrial work experience and a passion for mentoring.

Education

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| Colorado School of Mines, Golden, CO
Doctor of Philosophy in Mechanical Engineering, <i>Advisor: Dr. Gregory Bogin</i>
Thesis: Modeling Large-Scale High-Speed Methane Gas Deflagrations in Confined Spaces:
Applications for Longwall Coal Mines | August 2019
GPA: 3.854 / 4.0 |
| Colorado School of Mines, Golden, CO
Master of Science in Mechanical Engineering | December 2015
GPA: 3.813 / 4.0 |
| Case Western Reserve University, Cleveland, OH
Bachelor of Science in Mechanical Engineering
Minor: Japanese Language | May 2011
GPA: 3.223 / 4.0 |
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Skills

Teaching: Facilitating, Mentoring, Writing learning outcomes, Creating assessments, Developing lessons/modules/syllabus, Providing a safe space, Recognize dominant learning theories and pedagogies, Record keeping/grading

Computer: Microsoft Excel/PowerPoint/Word, MATLAB, ANSYS Fluent, SolidWorks, Fortran, LaTeX, Mathematica, OS - Windows & Ubuntu, Engineering Equation Solver (EES), Familiar with: OpenMP/MPI, HPC, AutoCAD, MultiSim

Administrative: Oral Communication, Teamwork, Technical Writing – Reports/Emails/Papers/Poster, Organization, Time Management

Laboratory: Safety, Troubleshooting, Gas Chromatography (TCD), Electrical Wiring, Plumbing, Instrumentation (Mass Flow Controllers, Pressure Transducers, Ion Sensors), National Instruments DAQ

Teaching Experience

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| Instructor, College of Science & Engineering, Seattle University | Fall 2019 |
| <ul style="list-style-type: none">▪ Instructor as part of the SCENG1000 course – Taught pre-engineering students about mechanical engineering skills and coursework through lecture and in-class demonstrations.▪ Faculty advisor for Senior Design. | |
| Fluids I Teaching Assistant, Colorado School of Mines, Golden, CO | Fall 2013, Spring 2014 |
| <ul style="list-style-type: none">▪ Taught six recitations weekly and worked examples to help students develop problem solving skills.▪ Facilitated peer learning during open office hours and assisted students with homework problems.▪ Collaborated with faculty members in developing, monitoring, and grading exams and projects. | |
| Fluids II Teaching Assistant, Colorado School of Mines, Golden, CO | Spring 2014, Spring 2016 |
| <ul style="list-style-type: none">▪ Provided real-world examples of fluid mechanics problems to help motivate students during recitation. | |

- Assisted in developing and grading group projects which enhanced students teamworking, communication, and design skills.

Guest Lectures:

Fluids I Topics:

- Internal Flow in Ducts
- Boundary Layers, Flow Over a Flat Plate

Fluids II Topics:

- Stream Functions and Flow Pathlines
- Moving Control Volumes/Turbojets & Turbofans
- Pump Performance Characteristics

Advanced Fluid Mechanics Topics:

- Flow Lines

Computational Fluids Dynamics Topics:

- Governing Equations for CFD – Fundamentals Part I & Part II

Combustion Topics:

- Turbulence & Turbulent Premixed Flames

- Auditing a Fundamentals of College Teaching course and participated in a 5-week Engineering Online Learning course at Colorado School of Mines.

Mentoring Experience

Research Experiences for Undergraduates Supervisor

Summer 2016, Summer 2017

- Supervised and mentored undergraduate engineering students during their first research experience.
- Trained students to work in a laboratory setting and emphasized a strong lab safety culture.
- Taught students the fundamentals of CFD and assisted students in running/assessing models.
- Provided feedback to students on weekly progress updates and their final research poster.
- Tutored students individually in heat transfer and other thermal and fluids courses.
- Participated in a Multicultural Engineering Program event touring first generation students around the combustion lab and discussing research and funding opportunities at the university level.
- Volunteered to sit on a student-run panel to discuss graduate school with new potential graduate students.

Research & Work Experience

Research Assistant, Colorado School of Mines, Golden, CO

May 2015 – Present

- Developed and validated a 2-D, computational fluid dynamics (CFD) and combustion model (ANSYS Fluent) of high-speed methane gas deflagrations in confined, obstacle-filled spaces to better predict the hazards of methane gas explosions in longwall coal mines.
- Performed methane gas combustion experiments to understand the impact of stoichiometry, obstacles, confinement, ignition location, and ignition energy on methane gas deflagrations.

August 2014 – December 2015

- Validated a high-accuracy, unsteady, 2-D CFD model and developed a complimentary, steady, 2-D CFD model of fluid flow and solute transport in reverse osmosis membrane filtration systems used to investigate the effects of solute boundary layer formation (Fortran).

Mechanical Engineer, McHenry & Associates, Inc., Warrensville Heights, OH

May 2011 - June 2013

- Designed HVAC layouts for commercial buildings, performed site surveys, drafted mechanical and refrigeration drawings (AutoCad), and created energy performance models for LEED accreditation.
- Collaborated with MEP & civil engineers, architects, contractors, and clients daily.

- Designed a HVAC layout utilizing a variable refrigerant flow system for a remodeled office space in Tomlinson Hall on CWRU's campus as part of my Senior Project.

Technical Presentations

- 1) Title: "CFD Modeling of Methane Flame Interaction with a Simulated Longwall Coal Mine Gob". North American Mine Ventilation Congress 2019, Montreal, Canada, May 2019.
- 2) Title: "A Fundamental Study of High-Speed Methane-Air Deflagrations Across Simulated Gob Walls and Sphere Beds", 11th International Mine Ventilation Congress, Xi'an, China, September 2018.
- 3) Title: "Investigation on the Overpressure Produced by High-Speed Methane Gas Deflagrations in Confined Spaces", Society of Mining, Metallurgy, & Exploration Annual Conference and Exhibit, Minneapolis, MN, February 2018.
- 4) Title: "A Fundamental Investigation of Simulated Gob Configurations on Methane Flame Propagation", 16th North American Mine Ventilation Symposium, Golden, CO, June 2017.
- 5) Title: "Effect of Simulated Gob Conditions on the Burning Velocity of Premixed Methane-Air Combustion", Society of Mining, Metallurgy, & Exploration Annual Conference and Exhibit, Denver, CO, February 2017.
- 6) Title: "High Accuracy Numerical Simulations of Concentration Polarization in Reverse Osmosis Systems", Rocky Mountain Fluid Mechanics Symposium, Boulder, CO, August 2015.

Journal Papers

- 1) **Strebingner, C.**; Bogin, G.E.; Brune, J.F. "Computational Fluid Dynamics Modeling of Methane Flame Interaction With Simulated Rock Rubble." Canadian Institute of Mining Journal, *Accepted December 2019*.
- 2) Juganda, A.; **Strebingner, C.**; Brune, J.F.; Bogin, G.E. "Discrete Modeling of a Longwall Coal Mine Gob for CFD Simulation." International Journal of Mining Science and Technology, *Accepted December 2019*.

Peer Review Conference Papers

- 1) **Strebingner, C.**, Bogin, Jr., G.E., and Brune, J.F., "A Fundamental Study of High-Speed Methane-Air Deflagrations Across Simulated Gob Walls and Sphere Beds". *11th International Mine Ventilation Congress*, September 2018.
- 2) **Strebingner, C.**, Fig, M., Blacketter, K., Walz, L., Bogin, Jr., G.E., Brune, J.F., and Grubb, J.W. "A Fundamental Investigation of Simulated Gob Configurations on Methane Flame Propagation". *16th North American Mine Ventilation Symposium*, June 2017.

Conference Papers

- 1) Nguyen, T.; **Strebingner, C.**; Juganda, A.; Brune, J.F.; Bogin, G.E. "2D Modeling of Methane Combustion in a Discrete Gob." *SME Annual Conference and Exhibit*, February 2020.
- 2) Fig, M., **Strebingner, C.**, Bogin, Jr., G.E., Brune, J.F., "Gob Location and the Propagation of Methane Flames in Simulated and Experimental Flame Reactors". *SME Annual Conference and Exhibit*. February 2019.
- 3) Juganda, A., Brune, J.F., Bogin, Jr., G.E., **Strebingner, C.**, "Discrete Modeling of a Longwall Coal Mine Gob for CFD Simulation". *SME Annual Conference and Exhibit*. February 2019.

- 4) **Strebinger, C.**, Fig, M., Pardonner, D., Treffner, B., Bogin, Jr., G.E., and Brune, J.F., “Investigation on the Overpressure Produced by High-Speed Methane Gas Deflagrations in Confined Spaces”. *SME Annual Conference and Exhibit*. February 2018.
 - 5) Fig, M., **Strebinger, C.**, Bogin, Jr., G.E., and Brune, J.F., “The Impact of Rock Pile Location on the Propagation of Methane Flames in Simulated and Experimental Flame Reactors”. *SME Annual Conference and Exhibit*. February 2018.
 - 6) Juganda, A., Brune, J.F., Bogin, Jr., G.E., **Strebinger, C.**, and Fig, M., "Incorporating Ventilation Network Simulation Into CFD Modeling to Analyze Airflow Distribution Around Longwall Panels". *SME Annual Conference and Exhibit*. February 2018.
 - 7) **Strebinger, C.**, Fig, M., Bogin, Jr., G.E., Brune, J.F., and Grubb, J.W., “Effect of Simulated Gob Conditions on the Burning Velocity of Premixed Methane-Air Combustion”. *SME Annual Conference and Exhibit*. February 2017.
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Posters

- 1) Treffner, B., Pardonner, D., **Strebinger, C.**, Bogin, Jr., G.E., Brune, J.F., “Investigating High Speed Deflagrations through Rock Rubble Resulting from Methane Gas Explosions in Longwall Coal Mines” Presented by Ms. Treffner at: BOTS Program Poster Session, Lakewood, CO. November 2017.
 - 2) Pardonner, D., Treffner, B., **Strebinger, C.**, Bogin, Jr., G.E., Brune, J.F., “Investigating High Speed Deflagrations through Rock Rubble Resulting from Methane Gas Explosions in Confined Spaces” Presented by Ms. Pardonner at: REU Poster Session, Golden, CO. July 2017.
 - 3) **Strebinger, C.**, Bogin, Jr., G.E., Brune, J.F., “Effect of Simulated Gob Conditions on the Burning Velocity of Premixed Methane-Air Combustion” Presented at: Mechanical Engineering Graduate Research Colloquium, CSM. April 2017.
 - 4) Walz, C., Blackketter, K., Fig, M., **Strebinger, C.**, Bogin, Jr., G.E., Brune, J.F., “Effect of Simulated Longwall Coal Mine Gob Conditions on the Burning Velocity of Premixed Methane-Air Combustion, Part I”, Presented by Ms. Walz at: REMRSEC Poster Session, Lakewood, CO. September 2016.
 - 5) Blackketter, K., Walz, L. Fig, M., **Strebinger, C.**, Bogin, Jr., G.E., Brune, J.F., “Effect of Simulated Longwall Coal Mine Gob Conditions on the Burning Velocity of Premixed Methane-Air Combustion, Part II”, Presented by Ms. Blackketter at: REMRSEC Poster Session, Lakewood, CO. September 2016.
 - 6) **Strebinger, C.**, Tilton, N., Serre, E., Martinand, D., Lueptow, R.M., “A Dedicated Numerical Method for Simulating Fluid Flow and Solute Transport in Membrane Filtration Systems” Presented at: North American Membrane Society, Boston, MA. May-June 2015.
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Awards & Extracurricular

Active Minds Bootcamp, Participant, *Spring 2018*

Dr. John Poate Fellowship, *Fall 2015*

Women in Science, Engineering, and Mathematics (WISEM), Active participant *2013-2019*

American Society of Mining, Metallurgy, and Exploration, Active participant *2015-2019*

“**Work-Life Balance**”, Personal photography show at The Book & Brew, *November 2017-November 2018*

Guest International Student Researcher – Aix Marseille University, Marseille, France, *June 2015*

Case Alumni Association Global Exchange Program for Engineers, Tokyo, Japan, *June 2008*

Personal Interests

Ice Hockey, Hiking/Backpacking/Camping, Photography, Arts & Crafts, Cooking,
Zero Waste, Yoga, Meditation, Mental Health Advocacy