Tell us about your work with computational fluid dynamics simulations in regards to your work with fixed bed reactors - can you provide examples that help explain how we are affected?

My work is focused around the production of intermediate chemicals from hydrocarbon (or fuel) processing. We use selective oxidization in fixed bed reactors to process fuels such as natural gas to create more reactive oxygenate molecules which lead to end products. One example of this process is partial oxidation of ethylene - a colourless, odourless stable gas - using oxygen, to create ethylene oxide, which can then form ethylene glycol, more commonly known as antifreeze.

My area of research mainly concerns how we can improve on conventional processes to move towards more sustainable energy and fuel processing techniques.

What is your favourite aspect of your research? What is most exciting for you?

Although the changes can be minute, it is exciting to find new understandings within an old process. The evolution of engineering and knowledge keeps me motivated to continue to find improvements.

Is there an area in your field (or outside of your field) that you would like to explore in the future?

I would be interested in exploring machine and statistical learning, to better understand the reactors.

Do you have any advice or words of wisdom for our students?

My advice, to potential and current PhD students in particular, is to follow your interests; you will find the career path more enjoyable if you are passionate about what you do.

Why or how is your area of research and discovery important for ordinary citizens?

We use simulations and small-scale experiments to explore standard practices to find areas for improvement. When we find and make small changes within the refining process, the changes compound and ultimately impact large-scale industries. The improvements we discover translate to monetary savings and more efficient use of our natural resources.