Meet Alexandre Hefren from Brazil

Having heard about York's global reputation for ground-breaking research, Alexandre Hefren decided to do his PhD here. Taking up opportunities such as becoming a Graduate Teaching Assistant and attending conferences, he's made the most out of his time at York.

Can you tell us a little bit about your research?

I'm researching quantum theory, more specifically the quantum backflow effect in the presence of defects. What does that mean? In a classical world, following common sense, if an object travels towards you the chances are that the object will get closer to you after some time. In a quantum world, the mathematics of the theory shows that this is not absolutely true, as the object may have less chance of getting closer, even though it's moving towards you.

Defects can describe general physical situations, but imagine, for example, there's a hole in the way between you and the object. How does that change the quantum backflow effect? That's the kind of question I'm looking into.

Why did you decide to do a PhD at York?

I decided to do a PhD because I'm curious about how things work, and I want to understand that at a fundamental level. I decided to come to York because a very knowledgeable German professor I met during my Masters in Brazil told me that York is the best place in the UK for my research interests. I checked out some of the work published by the research staff in the Department of Mathematics and I chose York.

Not only does my supervisor have an international reputation in his area of expertise, but the Department is respected worldwide. As well as academic reasons, I chose to come to York because it's a beautiful city and a peaceful and ideal place to learn and live.

What skills and experience have you gained through your PhD?

Before starting a PhD I'd always wanted to study a topic in a linear way, following different books of my preference. But while studying for my PhD I've come to better understand that knowledge is not linear. Research shows you that books do not cover most of the questions you have – you're responsible for finding answers to your questions, or discovering them if no one else has before. I've improved my learning abilities and started contributing to the vast body of scientific knowledge.

I've had the opportunity to teach undergraduate students as a Graduate Teaching Assistant since the beginning of my PhD. My teaching has substantially improved while I was doing research. I also gained experience of meeting people at conferences both inside and outside the UK. All these experiences are naturally accompanied by an enhanced academic maturity that makes me feel more confident about my future career. More generally, a PhD can help you with discipline, professional relationship skills, written and oral communication skills. It trains you to focus on the most relevant aspects of anything you decide to analyse.

How would you describe your time as a PhD research student at York?

Probably the best time of my life so far. I believe it will be very special to me when I look back in the future, even with the difficult pandemic we've been facing. I have a very attentive and supportive supervisor who encourages me and is always available when I need him. Since I first arrived in the friendly environment of York, I've felt really excited to be part of our University. Being an international student, I've learned so much about British culture while still benefitting from the diversity at the University.

Most of my time as a PhD student is devoted to working on my research and some teaching, but I always reserve time for rewarding activities like playing table tennis, basketball, going to the gym or having a nice chat with friends in my college. At York, I've met many people of different cultures and made some great friends.

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