

Dr Youssef Gaber, AMD Applications Engineer at Renishaw

Youssef undertook his PhD at the University of Birmingham in Metallurgy and Materials Science. His research focussed on applying Positron Emission Particle Tracking (PEPT) to simulate the motions of non-metallic inclusions in steel castings, in order to develop an experimental technique that can be used to validate some of the commercial mathematical modelling packages that are used in the shape castings industry, such as MAGMASoft and Flow 3D.

The results were published in several journals and conference papers, one of which was awarded the British Foundry Medal ICME.

After returning from Egypt, Youssef went back to the University, this time to work as a Research Fellow at the Quantum Hub for Sensors and Metrology.

What did you do after your PhD?

After my PhD, which I completed at the University of Birmingham, I went back to Egypt to work in the steel industry. My studies were sponsored by one of Egypt's largest steel manufacturers, and my plan has always been to use my research to help develop the steel business in Egypt.

I worked as an Operations Manager, and I was responsible for supervising the performance of four steel rolling mills, which had a combined annual capacity of 2.5 MTPY, as well as two steel melting shops (2.6MTPY). I worked to maximise operational efficiency across the business.

After a while, I moved back to the UK, and took up a post as a Research Fellow at the University of Birmingham. Here, I took responsibility for several characterisation and development programmes, which were aimed at developing the processing of metal powders using additive layer manufacturing techniques, for aerospace and automotive applications.

Tell me more about your work as a Research Fellow.

I worked with Dr Moataz Attallah, the Systems Packaging lead at the Hub. Our overall objective was to bring together advanced manufacturing expertise to develop new packaging systems.

Georgios Voulazeris (now a Senior Technician at Magnetic Shields Ltd) and I worked together to develop 3D magnetic shields for gravitational sensors, and to set up a mobile sensor to make it easier to use quantum technology.

The aim was to utilise powder bed additive layer to fabricate complex magnetic shield geometries and tailoring the microstructure to maximise the shields' magnetic properties.

How did you find your way into working in industry?

The knowledge and experience acquired from my time at Birmingham, particularly working alongside Kai Bongs and Moataz Attallah, paved a smooth path to my current role as an Applications Engineer at Renishaw, one of the world's leading manufacturers of additive manufacturing powder bed machines.

Studying and researching in the Hub brings a lot of opportunities as it widens access beyond academia to other networks, and is why I am working now in industry.

What is your role at Renishaw?

I am part of Renishaw's Solutions Centre team, who are responsible for supporting industrial partners through their journey with additive manufacturing. The aim of the solutions centre is to

showcase Renishaw's product line and provide customers with the knowledge and expertise required to either build their confidence in additive manufacturing, or simply to meet a specific set of project objectives.

This role requires the synergy between a specific set of technical skills as well as an exposure to the wide range of technical requirements by aerospace and automotive industry. My work with Moataz Attallah armed me with the appropriate technical expertise and a better understanding of the technological needs of some of the world's leading businesses.

What was your impression of the Hub?

The Hub is a great environment. The set-up is very well thought-out and is a good place to be if you are passionate about translating quantum knowledge into applications, and are keen to see and learn how this will impact industry.

There is access to funds and resources helping researchers to independently push boundaries.

What would you say to someone thinking of studying at the Hub?

The Hub recognises the need to keep up with advanced technology. If I did not have the opportunity of researching at the Hub when coming back from Egypt from the castings industry, it would have been difficult to secure work in a competitive job market. The unique skills and experience I gained whilst at the Hub has definitely given me the edge in an industry workplace.