



WHY IT MATTERS...

AERONAUTICAL & AUTOMOTIVE ENGINEERING



Loughborough University

Dr Ashley Fly

Lecturer in Vehicle Electrification

We all know the world is going through a climate crisis, and transport currently contributes over 20% of global CO2 emissions. Zero emission electric vehicles, powered by renewable electricity, will help reduce transport emissions as well as reducing harmful particulate emissions from burning petrol and diesel.



My research looks at how best to operate batteries in electric vehicles so you can drive longer, have a more accurate range estimation, and increase the overall lifetime of the battery before it is recycled. This includes looking at how to heat and cool the batteries so they are at the ideal temperature and how to perform 'health-checks' on the battery to identify potential faults and predict how much lifetime the battery has left.

Battery research is a very diverse community requiring a wide range of skillsets; we need chemists and material scientists to develop new battery materials, chemical engineers to scale up production, manufacturing, mechanical and automotive engineers to make the battery packs and vehicles and electrical and systems engineers to work on the control and management systems.

Working and interacting with people from so many fields means you are always learning something new, even if you are an expert in one area! I also like to work closely with industry in my research and have worked on electric vehicles with a range of automotive companies including Ford, Jaguar Land Rover and McLaren Applied.

Post 16 Education:

A Level Maths, Physics, Design & Technology

Higher Education:

MEng Automotive Engineering
PhD (Doctor of philosophy) Automotive Engineering

Why did you choose to research electric vehicles?

I have always loved the idea that with research you are doing something new that has not been done before, you are essentially creating new knowledge.

The thing that appeals most about electric vehicle research is that it is developing so fast and research is making its way into production much quicker compared to other industries.

There is also so much that we do not understand about electric vehicles and the lithium-ion batteries they use. Petrol and diesel vehicles have had over 100 years of development, we are just at the beginning of what is possible with electric cars!



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Ashley's experience as a student

I really enjoyed my experience as an undergraduate student at university, I made some lifelong friends, expanded my horizons, and certainly made the most of student life!

My degree was five years long with four years spent studying and one year working in industry as a design engineer for Triumph Motorcycles. I highly recommend a 'sandwich' course with a placement year if you have the opportunity.

One of the great things about university is the mix of different people with varied interests. During my degree, I decided to sign up for a different club every year, working my way through gliding, cycling, mountaineering and sky diving in the process!

Ashley's Career

During my degree I decided that I wanted to pursue a career in research and contribute to cutting edge technology. This led me to stay on at University and study for a research degree (PhD). I saw a poster advertising studentships in hydrogen fuel cell vehicles so applied for that!

Four years (and four continents!) later I completed my PhD and became a Research Associate in the same lab on a UK government funded project with several universities in South Korea. After another three years, including two months in Korea, I was awarded my current position as Lecturer in Vehicle Electrification at Loughborough University where I lead a team researching battery and hydrogen electric vehicles.

I never considered becoming an academic when doing my A Levels, but it's what I do now and I love it!

Ashley's Advice: Be confident in yourself and your ability to succeed and avoid underselling yourself when looking into the future.

Before starting university, I thought I would not be smart enough to fit in. Now having experienced all aspects of university from student to lecturer, I realise that was not the case and universities are full of normal people who are passionate about what they do!

Also, make a career plan. Research the qualifications and skills you will need to achieve that goal, but don't be afraid to change and adapt your plan as you learn more.

Loughborough University offer: Aeronautical Engineering MEng and BEng degrees

Loughborough University offer: Automotive Engineering MEng and BEng degrees