The SUN interview - Julia Hunter-Anderson

Where is your research focussed?

My research interests include tailoring of industry/Agency standards and systems engineering practices, such as concurrent engineering, to small hands-on educational satellite projects that span multiple years.

With experience and education also in the world of Environmental Governance, I am particularly interested in how (small) satellites could be used to fulfill some of the many gaps in operational biodiversity monitoring needed to support the Sustainable Development Goals, identified by groups such as GEO-BON and IPBES.

What areas do you lecture in?

In my role as Co-Director of the University of Warwick Satellite (WUSAT) Programme, I lecture in Space Systems Engineering to MEng students working on hands-on Space projects. I also provide ongoing engineering and management guidance throughout the projects. All of our projects, in the 12+ years of WUSAT run by Dr Bill Crofts, have been designed for a 'launch'. So it is crucial that the students are brought quickly up to speed on the specifics of Space Systems, and work in a disciplined, coordinated way in order to ensure a sufficiently high quality product and a smooth handover to the next year's team; key skills that will also serve them well in any industrial/Agency project. After a highly successful launch of the WUSAT-2 cubesat ejected from an ESA REXUS rocket in 2016 (first in 17 REXUS missions to receive a signal), WUSAT-3 is taking us to the next level! As we are targeting a launch to LEO, ensuring an even stronger systems engineering led approach, without stifling specialist innovation, has been key.

What are you most proud of in your teaching and research?

At Warwick our MEng students follow a common core curriculum applicable to any industry, finally specialising in one discipline such as mechanical, electrical, systems engineering. Students participate in a multi-disciplinary hands-on final year project, which could be applying their knowledge and skills to any industrial context. WUSAT-3 is one such project, and is part of a wider and growing WUSAT Programme. Since joining the Programme nearly 2 years ago I am proud to be bringing my industrial/Agency experience to our project teams and seeing them grow as confident

young engineers, working together and respecting each other's discipline speciality, with fresh ideas, commitment and enthusiasm.

I also focus student attention on the difficult task of defining requirements that meet a real customer need. In the case of WUSAT-3, for wildlife monitoring, this has involved working with our key collaborators at the Max Planck Institute of Ornithology, research biologists and animal tag manufacturers. It is highly satisfying that our students have consistently identified that believing they can 'make a positive impact' to real world challenges is one of their important outcomes from the project.

You have a wealth of experience in industry. What are your best memories of that time so far?

That's a difficult one, I feel very privileged to have had such varied experiences from space to ground systems development to in orbit operations, across all project phases. Working on the redesign of the solar arrays for Hubble may be one of the coolest and earliest career experiences. However, leading the EUMETSAT system and spacecraft operations preparation teams for the Meteosat Second Generation Programme during early system design to routine ops of MSG2 was definitely the (long!) highlight. Every day was different, my teams were incredibly professional and devoted. Being in operations is the 'sharp end' of space projects. Working respectfully with teams across industry and nationalities was crucial. Ensuring that all the bits of the system puzzle fitted together so that we could deliver what the End-Users 'needed' in order to ensure sufficiently accurate real time weather forecasting data, was an enormous challenge that often had us jumping through burning hoops!

Highlights include being part of the LEOP team that recovered MSG2 from a near disaster - a great Christmas present in 2005. And seeing the first image from each satellite was always a special moment. Even now I can look at the Meteosat images and know that I was part of the overall success story along with fantastic colleagues across Europe.

My interest in the End-User perspective of Earth observation led me to study for a Masters in Environmental Governance in 2011, which was a sobering and focussing experience. Memories of fieldwork in both developed and developing nations brings a clear motivation to my current research interest and work on WUSAT-3.

What do you find most helpful about being a member of the Space Universities Network?

SUN provides excellent potential for networking and collaboration with fellow academics across the UK and other experts within the wider space industry and Agencies. Our project depends on our strong team of collaborators as we navigate the tricky world of launching a satellite without the budget or infrastructure of an Agency or established industrial contractor.

In the light of changes to the regulatory launch framework, I would hope that educational hands-on project teams within SUN can address these challenges together, in order to ensure that this important educational opportunity is accessible to newcomers as well as more established groups