

IET International Travel award Report

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SciX 2023 Conference

At the start of October I attended SciX 2023 in Sparks Nevada, USA, thanks to the support from the IET international travel award. SciX, with the tagline of 'The Great Scientific Exchange', is organised by the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS) and brings together societies and those working in relevant areas, to network and attend short courses, presentations, and exhibits. This year was the 50th annual conference, and it therefore attracted a large number of people, while including some fascinating keynote presentations from highly regarded spectroscopists such as Prof Peter Griffiths.

With the funding from the IET, I was able to attend a 2-day course at the start of the conference titled 'Spectral Interpretation of Vibrational Spectra'. Vibrational spectroscopy includes infrared and Raman spectroscopy, of which Raman spectroscopy is one of my main areas of work. With my background in electronic engineering, this is an area I have had less formal training in, and this course has allowed me to more easily identify the chemical groups present within a large range of samples. I would thoroughly recommend this course for anyone interested in Raman or IR spectroscopy. I am excited to use and develop these skills further and combine them with my engineering knowledge.

I was very grateful to have the opportunity to present two areas of my work at SciX, one on graphene biosensors and another on pharmaceutical multiparticulate formulations. Both talks had positive interest from the audience, and it was great to discuss these topics with international experts in these areas. Our work on graphene biosensors (<https://doi.org/10.1063/5.0064136>) focusses on surface characterisation methods, to identify any changes and improvements that could be made to increase the selectivity or sensitivity. Graphene is a desirable material for use in sensors, due to the high electrical conductivity (increased sensitivity), high tensile strength (increased durability) and high surface area (optimised areas for detection). To produce graphene biosensors, typically the graphene is functionalised with specific chemical groups which can subsequently bond to bio-receptors such as antibodies. In the case of graphene, the success of the attachment of these chemical groups can be determined through techniques such as Raman spectroscopy, atomic force microscopy (AFM) and x-ray photoelectron spectroscopy (XPS). In my talk I outlined how the combination of these techniques can be used to further the development of graphene biosensors.



Figure 1 (Left) Presenting my work on 'Raman spectroscopy characterisation methods for CVD-grown graphene in biosensors applications'. (Right) Presenting my work on 'Advanced imaging methods for studying structure morphology and excipients solid state transformations in pharmaceutical multiparticulate formulations'

My other talk focussed on imaging methods to monitor chemical and physical changes to multiparticulates due to product aging. I presented results from advanced characterisation techniques including stimulated Raman scattering (SRS) microscopy and environmental scanning electron microscopy (ESEM). We envisage these techniques to be useful in furthering the development of a range of future medicines formulations.

The SciX conference provided many opportunities for networking, and I was able to meet people from all over the world, working in a range of spectroscopy and analytical chemistry fields. There were many exhibitors from instrument manufacturers and societies, facilitating interesting talks where I was able to learn about the latest laboratory equipment. I renewed my membership to the Coblenz society and attended their evening event which was great, and there were several poster sessions that I was able to attend throughout the conference. On the final evening of the conference, there was a dinner with a theme of the 70s, the decade in which FACCS first started the annual international conference. I met several people at the dinner and chatted to some people who had been attending similar talks to me.

Overall, I am incredibly grateful to the IET for their support through this travel award. It is challenging to find the funding to travel to international conferences such as those in the USA, and I feel it has been very beneficial for my development and overall career. I would really encourage others to apply for the IET travel award. I feel this conference, and in turn the IET travel award, has allowed me to gain a significant amount of knowledge through the course, and through attending very interesting presentations and networking. I think it has helped me to grow my presentation skills, especially in person, and has given me the opportunity to disseminate my work to those using similar techniques.



Figure 2 (Left) Attending a networking event. (Top Right) SciX 2023 banner inside the conference venue. (Bottom Right) Visiting the local Lake Tahoe.