

## IET Travel Award 2022 - Final Report



**Adam F. McKenzie**

University of Glasgow, Glasgow, UK

Vector Photonics Ltd., Glasgow, UK



Metalorganic vapour phase epitaxy (MOVPE) is the key enabling technology in the manufacture of the high-performance semiconductor light sources and detectors that are driving the current revolution in communications and sensing technologies, and the Internet of Things. MOVPE is a now well-established technique in industry and academia and is crucial in device development as it allows for precision control and tuning of the complex layer structures required down to the sub-nm level.

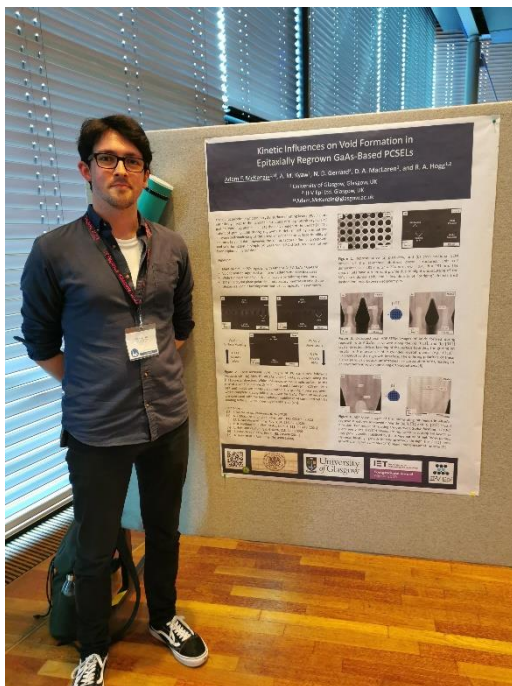
The International Conference (IC) on MOVPE is the premier gathering of crystal grower in the field of compound semiconductor materials and devices, and provides a unique opportunity for engaging with both academic and industrial leaders from around the world, and keeping up to date with the state-of-the-art research and concepts. The biennial conference last took place in 2018, before the start of my PhD, and with the COVID pandemic causing the subsequent event to be postponed, this year's conference was the last chance for me to attend before submitting my thesis.

Thanks to the IET Travel Award, I was able to attend ICMOVPE XX in person in Stuttgart, Germany, and present both a talk and poster on my research into photonic crystal surface emitting lasers (PCSELS) – a new class of device entering the commercial market. Both my poster “Kinetic Influences on Void Formation in Epitaxially Regrown GaAs-Based PCSELS” and talk “Large Area 2D Selective Area Growth for Photonic Crystal Surface Emitting Lasers” were met well by the community and prompted many discussions about PCSELS as a technology and future directions of my research.

Taking advantage of the many networking opportunities provided by the conference allowed me to meet and engage with other members of the MOVPE and laser communities, and build connections that will be invaluable in the early stages of my career. Meeting and discussing my work with Russ Dupuis, a legend in the fields of crystal growth and semiconductor lasers, was a particular highlight, and the advice he gave me is something that will stay with me as I emerge from my PhD.

The Travel Award also allowed me to visit Munich for a day, where I met with German colleagues to discuss an exciting new collaboration based on my research on void formation in PCSELS. Whilst still in its embryonic stages, initial work done in Germany has yielded promising results that may help deepen our understanding of the mechanism behind this phenomenon. I hope to build on this work and strengthen our collaboration with subsequent research visits in the future.

In all, I am extremely grateful to the IET for their continued support throughout my PhD, first through a Postgraduate Prize in 2020 and now through this Travel Award. There are tremendous benefits to membership of the IET, and I would highly recommend that others take the chance to join and apply for travel and research support where they can. My visit to Germany and participation at ICMOVPE was the perfect way to end my PhD journey, allowing me to build connections in the international MOVPE community that I will carry with me into the next stage of my career.



Poster (left) and talk (above) presented at ICMOVPE XX made possible by an IET Travel Award, and the Royal Commission for the Exhibition of 1851, who funded my PhD.

