



The EPSRC Centre for Doctoral Training (CDT) in Compound Semiconductor Manufacturing is coming to the end of its first year of operation, so it seems a good time to let you know what we have been doing over the last 12 months. We would be keen to receive any feedback from you and to hear how we can keep you informed and engaged, so please do get in touch.

Peter Smowton, CDT Director  
Khaled Elgaid, CDT Industry Interface Director

## Our students



At the heart of the Centre for Doctoral Training are our students. Although they had to contend with dramatic changes because of COVID-19 restrictions, the seven students in our inaugural intake have successfully completed the taught elements of the MSc and are submitting their dissertations at the time of writing

On 1<sup>st</sup> October, they will begin their PhD projects. We are delighted that five of them have industry support.

### Front Row:

- Cobi Maynard is working on “Compound Semiconductor Waveguides for Integrated Photonics”, a project that is part-funded by **Newport Wafer Fab** and supervised by Daryl Beggs.
- Paradeisa O’Dowd Phanis is supervised by Manoj Kesari. Her project “Setting LWIR state of the Art using T2SL detectors (LIRA)” is part-funded by **Leonardo**.
- Rachel Clark is working on “Standardising measurements of semiconductor quantum light sources” on a project part-funded by **National Physical Laboratory** and supervised by Anthony Bennett.

### Back Row

- Seyed Ghozati’s project is “Optimization of ohmic contact for GaN MMIC Power Amplifier on silicon for Millimetre-wave Applications using Au Free process”. He is supervised by Khaled Elgaid.
- Bogdan Raitu’s project is part-funded by **Rockley Photonics**. He is working on “III-V on insulator by tunnel epitaxy for silicon photonics” supervised by Qiang Li.
- William Cripps, supervised by Rick Smith, is starting his project titled “Deterministic nanoscale transfer printing of compound semiconductor nanowires for large scale device integration”.
- Tristan Burman, whose lead supervisor is Peter Smowton, is part-funded by **SPTS Technologies Ltd**. His project is “Developing fabrication processes for optoelectronic devices”.

We are expecting 16 students to join us for the second cohort of the CDT and 14 students in each of 2021, 2022 and 2023. If you are aware of a promising candidate, please encourage them to have a look at our [programme](#).



## PhD Project Process

The CDT is designed to enable students to gain an understanding of various aspects of compound semiconductor research and manufacturing during their first year, with project selection occurring mid-way through that year.

The MSc project in the summer is a foundation for the three-year PhD project, which begins in October of the second year.

A number of outline projects have been submitted for the 2020 selection round - brief descriptions of the projects received to date can be viewed on the [CDT's website](#). Some of these are still available for industry part-funding.

Full proposals are due by 30<sup>th</sup> October, so there is still time to submit a project for 2021 project starts. We would be happy to facilitate introductions to academics who would be suitable to supervise topics. Contact our Industry Interface Director, Khaled Elgaid, via [semiconductors-cdt@cardiff.ac.uk](mailto:semiconductors-cdt@cardiff.ac.uk)

## Guest Lectures & Site Visits

Exposure to manufacturing environments, early in the PhD, is key to meeting our aim of training the new generation to understand how to facilitate the translation of research into production. We are therefore grateful to those who have contributed to our programme of guest speakers and site visits.

- **Newport Wafer Fab** hosted the students in October, providing an overview of the CS Cluster in general and then allowing them to suit up and tour the fabrication facility.
- In the spring, Sam Evans and Peter Griffiths from **NWF** were joined by Brian Raeburn, of **DISCO**, who delivered a two-part talk on wafer thinning technology and its application.
- Students also visited **IQE's** megafoundry and heard from Chris Meadows about its work.
- Matt Day, **SPTS Technologies**, provided a session on ICP plasma processing and its application in CS.
- Mark Dineen, of **Oxford Instruments Plasma Technology** helped students understand the transition from research to high volume manufacturing.
- The **CSA Catapult** provided a three-part session outlining their portfolio with talks by Tudor Williams, Head of RF and Microwave; Ingo Ludtke, Head of Power Electronics; and Joe Ganicliffe, Head of Photonics.

Our aim is to provide a holistic understanding of the entire manufacturing process to our students over their four years in the CDT. We are in the process of developing the programme of guest lectures for 2020-21, so if you would like to get involved, please get in touch with us via [semiconductors-cdt@cardiff.ac.uk](mailto:semiconductors-cdt@cardiff.ac.uk)

## ‘Brightening the Future’, 25 November 2020

Each year, the CDT will be holding an event to bring together our students, our industry partners and our academics. The students have chosen the theme of ‘Brightening the Future: exploring the social, economic and environmental impact of compound semiconductor photonics and optoelectronics research and industry in the UK’. This year, it will be on-line, due to COVID-19 restrictions, though we are hopeful that in future we will have the opportunity to meet face-to-face. More details will follow on the programme will follow.

## Publications & Grants

It has been a busy year for the academic staff at all four University partners. To see what they have been working on, view a list of publications on the [website](#) of the EPSRC Future Compound Semiconductor Manufacturing Hub, which collates the information.

## Progress on the Translational Research Facility (TRF)

Work is progressing well on the TRF, which will be the new home of the Institute of Compound Semiconductors (ICS). The build is due for completion in early 2022. The new 1450 square metre cleanroom within TRF will house state of the art equipment and provide industrial standard semiconductor device fabrication capability for advanced device fabrication and process development, prototyping and piloting capability, characterisation research and training.



### CDT Management Board

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