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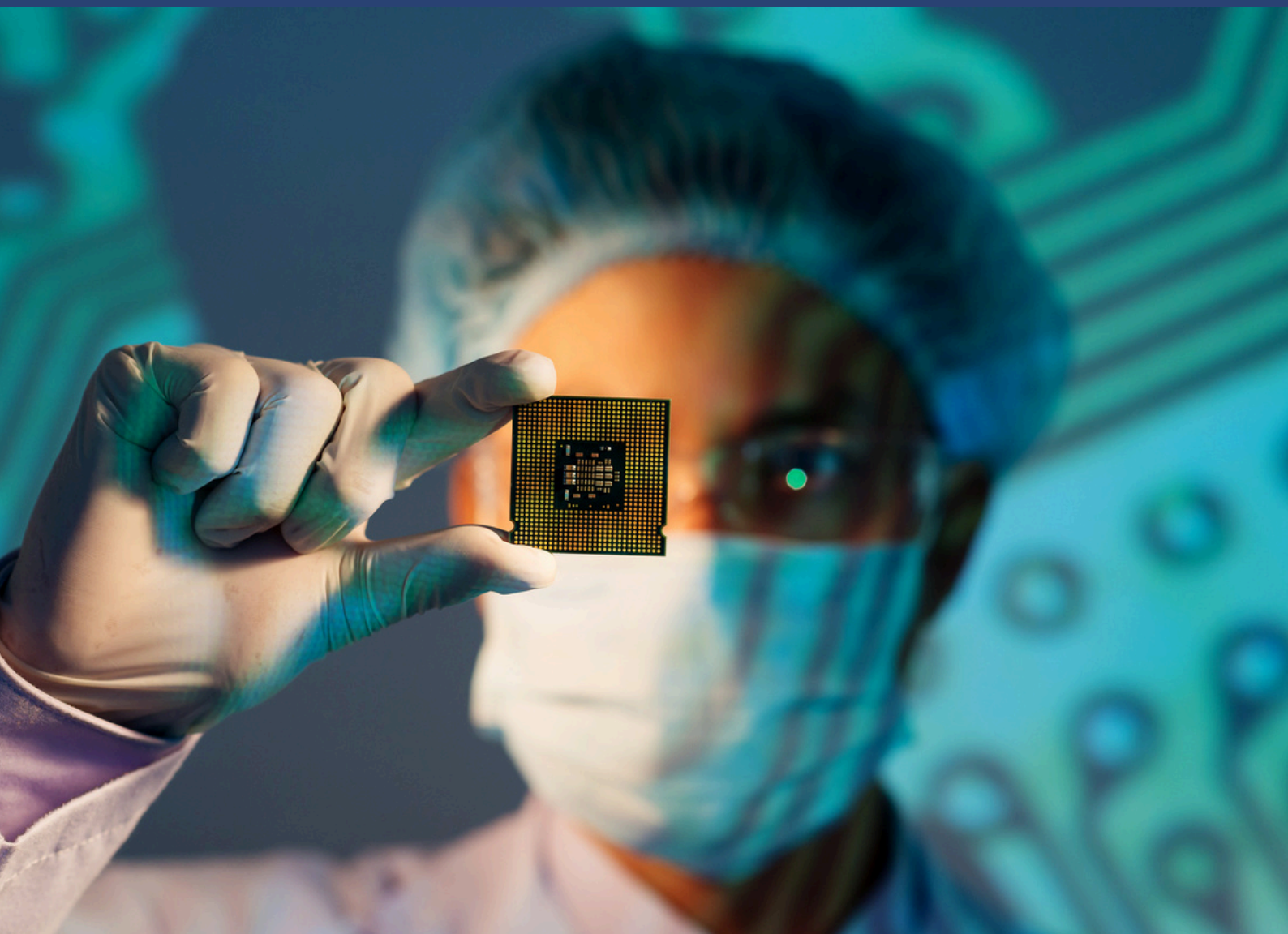
UK Electronics Skills Foundation

Semiconductors in South Wales

Industry | Innovation | Careers | Opportunity

From powering the industries of the past to teaching the skills that now drive clean energy and digital technology, South Wales is a place where learning and making go hand in hand.



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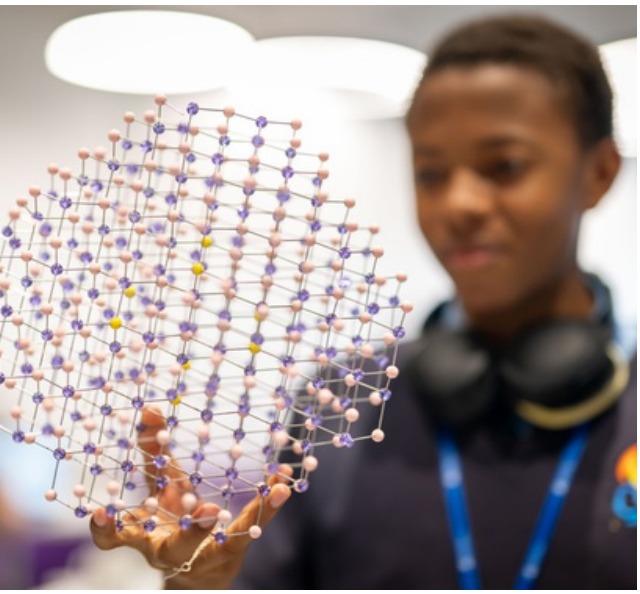
From Newport to Cardiff, South Wales is leading the UK's move into next-generation Electronics.



Just off the M4, scientists and engineers are working with materials like gallium nitride (GaN, a substance composed of gallium and nitrogen) to make faster, more efficient computer chips, to power our mobile phones, electric cars, satellites, 5G networks, and many other technologies we use every day.

But what makes this region truly special is that education and high-tech opportunity have been fostered through the close collaboration between its universities, colleges, and companies. Born from these strong local partnerships, the world's first compound semiconductor cluster, CSconnected, was established to bring together and share skills, research, and technology across the local communities and across diverse educational levels.

To this day, this collaboration helps universities and businesses to train new talent, supports students at local universities and colleges to learn alongside world-class semiconductor firms, inspires young students through workshops and outreach initiatives and supports the next generation of electronics by creating new opportunities close to their homes.

Discover more about CSConnected

When ideas meet action

SOUTH WALES

In South Wales, ideas quickly turn into real technology! Scientists, researchers, engineers, and students at **Cardiff University**, **University of South Wales**, or local colleges such as **Coleg y Cymoedd** help turn research into real products shaping how we live, communicate, and move every day.

From semiconductor firms like **IQE** and the **Compound Semiconductor Applications Catapult** in Newport to university labs at **Swansea University**, collaboration between education and industry transforms creative thinking into cutting-edge technology.

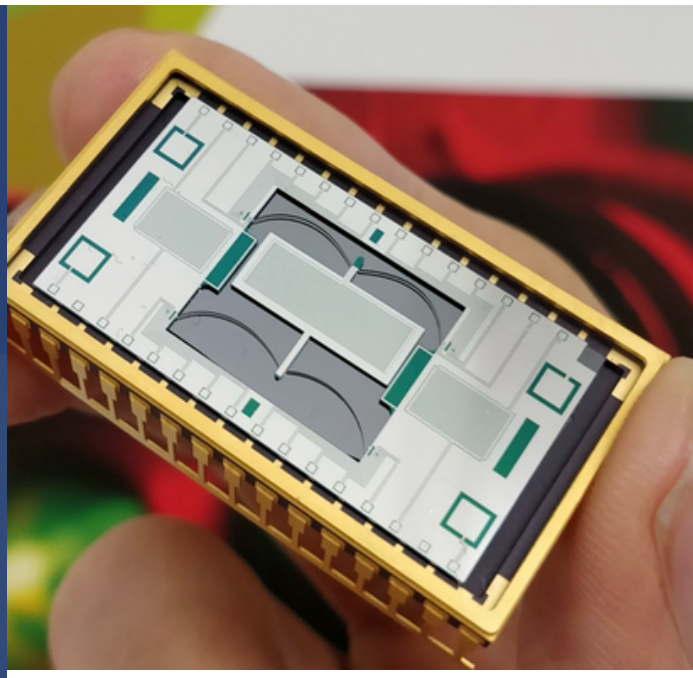


Image courtesy of the
James Watt Nanofabrication Centre
University of Glasgow
© Richard Middlemiss

Curious about studying Electronics Engineering? Explore local opportunities

- Cardiff University Institute for Compound Semiconductors
- Swansea University Centre for Integrative Semiconductor Materials (CISM) DER-IC
- EPSRC Centre for Doctoral Training (CDT) in Compound Semiconductor Manufacturing (CSM)
- Cardiff University
- Swansea University
- University of South Wales
- Open University
- Coleg y Cymoedd Cardiff and Vale College
- Cardiff Metropolitan University
- College Merthyr Tydfil
- Coleg Gwent
- Bridgend College
- Newport and District Group Training Association
- Oriel Science
- WJEC

Local organisations

KLA

(SPTS Technologies)
Newport NP10 8UF

KLA in Newport designs and builds the advanced machines used to manufacture semiconductor chips, creating tools that can etch, shape, and prepare materials with incredible precision. These machines are essential for producing the tiny components found inside phones, electric cars, satellites, medical devices and 5G networks across the world.

As one of the UK's leading equipment manufacturers, KLA offers future opportunities for students interested in mechanical engineering, electronics, software, or practical problem-solving, with pathways into technician roles, engineering careers, and hands-on work with cutting-edge semiconductor equipment right here in South Wales.

NOVOMORPHIC

Cardiff CF23 8FN

Novomorphic designs custom semiconductors and electronic systems by working out how tiny electronic components should be organised and connected. The company doesn't manufacture the chips itself; instead, its engineers design and test how processors behave and work on designing them to run faster and use less energy.

An important part of Novomorphic's work is the use of Edge AI supported by secure intelligent electronics. Edge AI combines computing and artificial intelligence to run smart tasks, such as analysing sensor data or making real-time decisions, directly on devices rather than in the cloud, allowing systems to respond quickly. When combined with secure intelligent electronics (systems that handle data safely), this results in designs for chips that are built to run fast, as well as reliably and securely.

The Research and Design (R&D) team works closely with academic partners, continually exploring new ideas to predict how a chip will perform before it is even built! If you enjoy computing, engineering, science, design or problem-solving, you could work in areas such as chip design, modelling, verification or system architecture, helping create next-generation electronic systems and system-first semiconductor solutions at a company like Novomorphic.

Local stories

HI, MY NAME IS JACOB

I am a 'Graduate Process Engineer' at KLA Newport. KLA manufactures semiconductor wafer processing equipment - basically, machines that make computer parts.

Our customers want to make sure that our machines can make a certain product - so it is my job to ensure that they can do so, and to show them how to do it. I also look at long-term improvements to our machines.

A typical day would usually include some demo work, such as demonstrating that the machine can get certain results specified by the customer. I would need to gather results by measuring the wafers after they have been processed through our equipment. Then, I may need to formally write up my findings and present these to a customer.

KLA Newport manufactures lots of different machines, that each can be used to make a range of devices. This means that we are present in a massive number of industries. Our machines are used to make devices in cars, mobile phones, data centres, healthcare, lighting and so much more.

What I enjoy the most about working in the semiconductor industry is the variety. Every day is different, so it keeps you on your toes.

It is also very exciting to work right at the forefront of technology. I am also looking forward to start travelling with work soon, but right now the biggest benefit for me is knowing how widely used my work is. It is hard to find an industry now that is not reliant upon the semiconductor industry!

If you are curious about Electronics but not sure it's for you, watch YouTube videos on the semiconductor industry and wafer processing.

You could also attend some career fairs/conferences as a lot are free, especially if you are in university. But if you don't fancy university, there are also a lot of apprenticeships available too.

Hands on science for all

Beyond laboratories and industry, science centres such as Oriel Science in Swansea and Techniquest in Cardiff bring this innovation to life. Through interactive exhibitions and hands-on experiments, they help you to see how Electronics and semiconductors connect to the world around you. They give you the chance to experiment, ask questions, and discover how science can turn into a future career.

The Compound Semiconductor Applications Catapult also supports this learning through its Skills and Education Programme, linking classroom curiosity with the real technologies being developed across South Wales.

Inside the mysterious world of compound semiconductors, Cardiff University CPD Unit

Oriel Science Exterior © Oriel Science

If you happen to be in Swansea, you can visit Oriel Science, and explore the world of semiconductors through hands-on exhibits and engaging talks.

Every weekend, you can try the 'chips & challenges' activity and actively learn how semiconductors power everyday life! Schools can also book the Future Technologies workshop, where you can explore how semiconductors shape everything from smart phones to smart cities. Four interactive exhibits: Semi-Town, Flexible Solar Cells and Warm Homes, Cool Planet showcase cutting-edge research from Swansea University and organisations such as Specific and SWITCH - Net Zero Wales, demystifying how semiconductors are used to power our lives.

All exhibits are family-friendly, designed to bring cutting edge research into the community and show how semiconductor technology is transforming the world around us.

Everyday impact

Across South Wales, new semiconductor technologies are already part of daily life, making the world faster, cleaner, and better connected.

Everyday Tech

This technology powers the phones, computers, and smart devices we rely on daily.

Transport

Chips help electric vehicles charge faster and use energy more efficiently.

Healthcare

Sensors designed by local companies support advanced imaging, medical monitoring, and diagnostic tools.

Communications

High-frequency components enable faster, more reliable 5G and satellite networks.

Energy

Engineers here design special electronic parts that help devices use electricity more efficiently, making batteries last longer and supporting cleaner, greener energy systems.

Opportunity in action

Do you see yourself as a technician, engineer, designer, researcher, or maybe an educator or science communicator?

The South Wales semiconductor cluster offers a rare chance to start working towards all these careers. With roles in research, manufacturing, design, and testing, there are opportunities to gain hands-on experience at every level. The region's strong education links mean that learning often leads directly into employment.

KLA building
© Jacob Allton

Want to explore local opportunities?

- IQE
- KLA
- Novomorphic
- Pavecost Manufacturing
- Vishay Newport
- Microchip
- Space Forge
- MicroLink Devices UK
- Kubos

In South Wales "opportunity" isn't just something you read about - it's something you can do!

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The UK has a long heritage of technological innovation and has a world-class Electronics sector. It has the potential to grow and innovate to provide solutions to some of the biggest challenges facing society today.

It is our mission to inspire more young people to pursue rewarding careers in this important industry, and give them the skills to thrive.

We are an independent, UK based charity, and we work collaboratively employers, universities and schools to raise awareness of, and promote interest in, Electronics and Semiconductors.

Find out more about our educational resources for:
Aspiring engineers
Teachers

Get in touch
ukesf.org
01285 862381
education@ukesf.org

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