



**A GRAPHENE SENSOR FOR DEFECT DETECTION & PREDICTIVE  
MAINTENANCE IN COMPOSITE MATERIALS**

**GRAPHOSITE**

Project reference: 104266

## **Open Day 2019 Workshop**

### **Preliminary Agenda Speakers & Participating Organisations**

**Date:** 20 November 2019

**Meeting Venue:** Crausaz Wordsworth Building  
Robinson College  
Adams Road  
Cambridge  
CB3 9AD



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## GRAPHOSITE Open Day 2019

### GRAPHOSITE Open Day Venue

The **GRAPHOSITE** Open Day is taking place on the **20th November 2019**, at **Crausaz Wordsworth Building - Robinson College**, Cambridge, at:

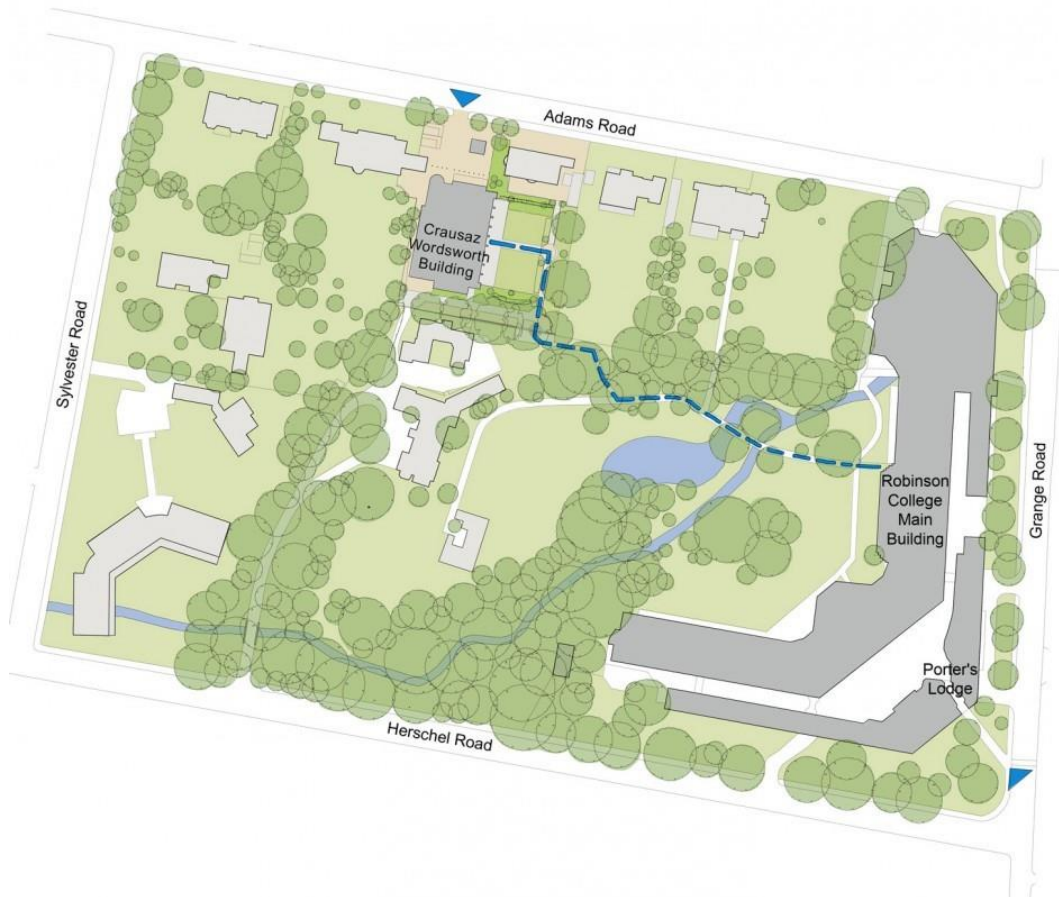
Plenary Suite  
**Crausaz Wordsworth Building**  
**Robinson College**  
 Adams Road  
 Cambridge  
 CB3 9AD



The **Crausaz Wordsworth Building** is part of **Robinson College** and can be accessed **from Adams Road**.



There is not parking available at the site however there is pay and display parking at the University Sports Ground, at the top of Adams Road.



## GRAPHOSITE: A Graphene Sensor for Defect Detection & Predictive Maintenance in Composite Materials

The **GRAPHOSITE** is 30-month project funded by **Innovate UK** (reference 104266) which started in August 2018, it will run until January 2021.

**GRAPHOSITE** offers a technological solution that addresses a significant challenge to composite materials – defect detection. It aims to apply graphene to a customised substrate to achieve enhanced defect sensing and predictive maintenance with increased sensitivity. The sensor will be embedded with the composite during manufacturing and will have high flexibility properties. A unique feature of the novel technology is that graphene will serve as the sensing element and act as the gate through which the electric current passes. Being an embedded part of the composite at manufacture, condition monitoring will therefore be continuous and in real-time.

[www.graphosite.co.uk](http://www.graphosite.co.uk)

### GRAPHOSITE Preliminary Agenda

**10:00** *Arrival and registration*

**10:15** **Welcome and GRAPHOSITE Open Day Introduction**

**Dr Bojan Boskovic**, Managing Director, Cambridge Nanomaterials Technology Ltd (CNT)  
**GRAPHOSITE** Project Exploitation and Dissemination &  
 Open Day 2019 Organisation

**Dr Sofia Sampehai**, Senior Project Leader, TWI  
**GRAPHOSITE** Project Coordination and Management

**10:30** Overview of GRAPHOSITE Project

**Dr Sofia Sampehai**, Senior Project Leader, TWI

**11:00** *Coffee Break - exhibition*

**11:30** **Dr Sofia Sampehai**, Senior Project Leader, TWI

**Title: TWI and role in the GRAPHOSITE Project**

TWI is one of the world's foremost independent research and technology organisations, with expertise in materials joining and engineering processes as applied in industry. TWI specialises in innovation, knowledge transfer and in solving problems across all aspects of manufacturing, fabrication and whole-life integrity management. Established in Cambridge, UK in 1946, the organisation has gained a first-class reputation for service through its teams of respected consultants, scientists, engineers and support staff. With around 800 employees, it works with over 1800 Industrial Member companies in over 70 countries. TWI currently operates from 54,000 square metres (581,000 square feet) of manufacturing, testing and training space; five UK and 13 overseas facilities serve both its Industrial Membership and its training and examination needs. A successful international Training and Examinations programme sees around 25,000 students trained each year in welding and inspection technologies.

**11:45 Dr Evelyne El Masri**, Project Leader, Non-metallic Innovation Centre (NIC) – *Guest speaker*

**Title: NIC: Non-metallics and beyond**

The Non-metallic Innovation Centre (NIC) is an integrated innovation centre focusing on advanced non-metallic technologies employed within the Oil and Gas (O&G) sector. The centre has been established to develop breakthrough technologies leading to novel applications for non-metallics in the Oil and Gas industry and to provide the required technical services for these new products. NIC is part of the Private Technology Innovation Partnership (PTIP) initiative at TWI. PTIPs work to address their technology priorities, fostering innovation and working towards commercialisation of technology with their sponsors and supply chain. NIC's initial focus is on composite pipe applications, but the goal is to develop breakthrough technologies leading to novel applications for non-metallics in the oil & gas industry and beyond.

**12:00 Thomas Greaves**, Haydale Graphene Industries PLC

**Title: Commercial applications for functionalised nanomaterials**

This presentation will give a brief introduction into Haydale and its patented functionalisation technology that it has developed to improve the interaction of nanomaterials when dispersed in polymer systems. This will be followed by an overview of some of the key applications that Haydale are currently focused on to support the commercialisation of nanomaterials. A number of case studies will be presented to demonstrate some of the significant steps forward that have been made over the past few years, with highlights including R&D activities in diverse markets such as elastomers and composites; where functionalised nanomaterials have been incorporated with a range of benefits.

**12:30 Dr Nithin Amirth Jayasree**, Research Fellow, Brunel Composites Centre

**Title: Molecular modelling of the Graphosite sensors**

**13:00 Lunch & exhibition**

**14:00 Dr Zlatka Stoeva** Managing Director, DZP Technologies Ltd.

**Title: Introduction to DZP Technologies Ltd**

This presentation will outline recent progress at DZP Technologies Ltd in the development of specialty conductive inks and pastes including conductive silver and carbon inks, graphene dispersions and inks, thermal materials, and various customised formulations. Examples will show how these new materials can help customers develop innovative engineering and technical solutions, and enable exciting new applications in 3D electronics, wearable technology, Internet-of-Things, robotics, and artificial intelligence.

**14:30 Dr George Maistros**, Managing Director at ADVISE-DETA

**Title: In-process sensors for quality control and optimisation of composites manufacturing processes**

The current activities of ADVISE-DETA are focusing on the application of process monitoring, optimisation and control of composite materials manufacturing based on measurements of the dielectric properties of the reacting resin. The company has developed all the components of a complete process measurement system, DETA SCOPE™, linked to highly durable dielectric sensors fit for batch and continuous processing of composites. The readings from the sensors are translated to actual material properties (i.e. viscosity and degree of cure) so that DETA SCOPE is called Cure Performance Monitoring System. The operation of the system helps to

improve the efficiency of production and also of determining optimal process conditions, which are inherently affected by the type of material and the geometry of structure.

The core technology development within ADVISE-DETA lies with sensors in the form of interdigital electrodes. They are sensing elements with custom design circuit in the form of grid of 'fingers' with spacing between fingers around 50 µm. In order to facilitate material state measurement, the company has developed several modelling tools on the electric field analysis of the sensor structures and on signal interpretation.

**15:00** *coffee break & exhibition*

**15:30** **Dr Sofia Billett**, Senior Innovation Consultant, Cambridge Nanomaterials Technology Ltd.

**Title: Exploitation and Dissemination activities of the GRAPHOSITE project**

## Guest presentations

**16:00** **Dr. Cem Selcuk**, Head of Business Development, TWI Innovation Network-TWIIN, TWI Ltd, UK

**Title: TWIIN - Innovation Accelerators / Technology Acceleration Programme TAP**

**16:30** **Tadej Bregar**, Project Manager, InnoTecUK, UK

**Title: Introduction to InnoTecUK and its role in the UltraMAT project ([www.ultrammat.co.uk](http://www.ultrammat.co.uk)): Power ultrasound as a generic tool for micro/nanoscale processing of metals**

**17:00** *Closing remarks*

**Note** It is planned that all presentations would be followed by Q&A discussion. The organisers reserve the right to change the programme, speakers or venue should circumstances require. For any further enquires please do not hesitate to contact directly the **GRAPHOSITE Exploitation and Dissemination Manager** Dr Bojan Boskovic on [info@graphosite.co.uk](mailto:info@graphosite.co.uk) or [Bojan.Boskovic@CNT-Ltd.co.uk](mailto:Bojan.Boskovic@CNT-Ltd.co.uk) or on his mobile phone +447780874335.

## GRAPHOSITE Open Day: Speakers and GRAPHOSITE Partners

### GRAPHOSITE Open Day Speakers



**Dr Bojan Boskovic**  
Cambridge Nanomaterials Technology



**Dr Bojan Boskovic** is the Founder, Managing Director and Principal Consultant of the company. He has more than 20 years of hands-on experience with carbon nanomaterials and composites from industry and academia in the UK and Europe. Previously, he worked as a R&D Manager at Nanocyl, one of leading carbon nanotube manufacturing companies in Europe. He also worked on carbon nanotube synthesis and applications as a Principal Engineer-Carbon Scientist at Meggitt Aircraft Braking Systems, as a Research Associate at the University of Cambridge, and as a Senior Specialist at Morgan Advanced Materials. During his PhD studies at the University of Surrey he invented low temperature synthesis method for production of carbon nanomaterials that has been used as a foundation patent for the start-up company Surrey Nanosystems. He was a member of the Steering and Review Group for the Mini-IGT in Nanotechnology that advised the UK Government on the first nanotechnology strategy policy document. Dr Boskovic was working as an advisor for the European

Commission (EC) on Engineering and Upscaling Clustering and on setting up of the European Pilot Production Network (EPPN) and European Materials Characterisation Cluster (EMCC). He has experience in exploitation and dissemination management on a number of FP7 and H2020 European projects, including UltraWire, NanoLeap, OYSTER, M3DLoC, Genesis and nTRACK. Also in UK Government InnovateUK funded projects, such as UltraMAT and GRAPHOSITE He is also a leader of two private membership based consortiums: Nano-Carbon Enhanced Materials (NCEM) and Advanced Materials for Additive Manufacturing (AMAM).



**Dr Sofia Sampethai**  
TWI Ltd.



**Dr Sofia Sampethai** is a Senior Project Leader at TWI with an extensive experience of project management of EC H2020 and Innovate UK projects. She has 3 years of experience in Nanotechnology, synthesis of nanomaterials and materials processing. At TWI, she is working on product development, management and preparation of collaborative opportunities and proposals on new ideas related to nanomaterials, structural integrity, structural health monitoring and condition monitoring.



**Thomas Greaves**  
Haydale Composite Solutions



**Thomas Greaves** has a BSc (Hons) in Chemistry which included a year working in industry in Manchester, UK. After completing his industry placement, Thomas was awarded the Society of Chemical Industry Prize for 2013. Thomas has since worked in the field of elastomers, composites and nanotechnology. In 2014, he spent 3 years with a large elastomer manufacturer where he was responsible for developing new elastomeric products from laboratory scale through to product launch. He was project lead on a number of high-profile projects, with projected annual revenues exceeding £1 million. Thomas joined Haydale Composite Solutions in October 2017. As Senior Project Engineer, Thomas is required to manage both commercial and grant funded projects in a wide range of speciality areas and industries. His role is focused on driving innovation in elastomers, composites and inks by demonstrating how the incorporation of nanomaterials into these systems enhances the mechanical, dynamic, electrical and thermal properties.



**Dr Nithin Amirth Jayasree**  
Brunel Composites Centre



**Dr Nithin Jayasree** is a Research Fellow at the Brunel Composites Centre. Completed his PhD at the Politecnico di Torino, Italy in 2017 on Finite Element analysis on high impact and crash phenomena on composite materials. He has participated in industrial and research projects mainly in the automotive sector, producing digital twins for composites structures operating in typical automotive environments. He is currently working for BCC for various research projects including GRAPHOSITE, which involves development of a Graphene Sensor for Defect Detection and Predictive Maintenance in Composite Materials.

**Dr George Maistros,**  
ADVISE-DETA



**Dr George Maistros** is the Technical Director of ADVISE-DETA. He is a Chemical Engineer from National Technical University of Athens in 1988 and received his PhD in Advanced Materials from

Cranfield University – UK in 1991, focusing on the dielectric cure monitoring of thermoset resin systems. He has over 20 years of experience in promoting dielectric sensing systems to all kinds of material processes, such as composites processing, repair of structures, nano-membranes operation and engine exhaust fumes characterization. He has authored 15 publications in scientific journals and 1 chapter in book. He has coordinated 3 Aeronautics FP6 (COMPROME, SENARIO, NOESIS) programs on applications of dielectric technology on composites manufacturing processes.



**Dr Zlatka Stoeva**  
DZP Technologies Ltd.



**Dr Zlatka Stoeva** is a Managing Director and a co-founder of DZP Technologies Ltd. Zlatka started her career as a scientist, following the completion of PhD degree at the University of St Andrews in 2001, where she worked on polymer electrolytes for lithium ion batteries. She then held post-doctoral research positions at the University of Aberdeen (2002) and the University of Nottingham (2002-2005) working on lithium ion conductors and other energy storage materials. In 2006, Zlatka moved on to a business-focussed role at the technology transfer office at the University of Cambridge. She spent several years in this role, working on the commercialisation, patenting, and licensing of technologies arising from university science. Since moving full-time to DZP Technologies in 2011, Zlatka initiated several R&D programmes and collaborative projects in which the company developed advanced materials for emerging applications, such as flexible and stretchable electronics, wearable technology, and sensors for the Internet-of-Things.



**Dr Sofia Billett**  
**Cambridge Nanomaterials Technology Ltd**



**Dr Sofia Billett** is a Senior Innovation Consultant at CNT Ltd., working on patent landscaping, market research reports and other innovation management related activities for EC H2020 and Innovate UK projects. She has extensive R&D, project management and regulatory experience. She has a scientific research background in biochemistry, environmental microbiology and toxicology.

## Guest Speakers



**Dr Evelyne El Masri**  
**Non-metallic Innovation Centre (NIC)**  
TWI Ltd



**Dr Evelyne El Masri** currently works as the Technical Operations Project Leader in the Non-metallic Innovation Centre (NIC) in TWI Ltd, Cambridge, UK. NIC is a collaboration between TWI, Saudi Aramco Technologies Company & ADNOC to enhance the application of non-metallics in Oil and Gas industry. I completed my PhD in the University of Southampton in the Institute of Sound and Vibration (ISVR). My research focused on novel algorithm to detect corrosion in embedded reinforcement in reinforced concrete structures. I demonstrate high expertise in Construction, FE modelling and Project Management as I worked as the Lab Manager for Lightweight Solution in Ciment de Sibline in Lebanon for first automated full production of lightweight construction elements. In addition, I worked for three years as site engineer for Betabat and Arabian Construction Company in Lebanon. I am a Chartered Engineer in the UK and an Associate Fellow in the Higher British Education. I hold a BSc and MSc in Structural engineering from Hariri Canadian University. I am currently seeking an MSc in Engineering Management, Supply Chain and Leadership with Aston University, UK.





Dr. Cem Selcuk  
TWI Ltd



**Dr Cem Selcuk** (BSc-Hons M.E.T.U, 1999 and PhD University of Nottingham, 2003) is the Head of Business Development for the TWI Innovation Network (TWIIN) at TWI after developing and growing the network with new innovation centres (academic partnerships) and many accelerator innovation programmes (industrial partnerships). Prior to that, he was the Manager and Head of Brunel Innovation Centre (BIC). He is an active professional member of the EPMA, APMI, IOM3 (FIMMM) and The Welding Institute (FWeldI). Cem has been the Chairman for the Particulate Engineering Committee (PEC) and involved in other committees (Vice-Chairman of the Defence, Safety and Security Committee-DSSC) hence is a member of several boards at the IOM3; Materials Science and Technology (MSTD) as well as Energy Materials Group. Dr. Selcuk sits on several sector groups at the EPMA (e.g. HIP, AM). Cem has over 300 citations to his publications (over 75) in peer-reviewed journals. Dr. Cem Selcuk is both a Chartered Engineer (CEng) and a Chartered Environmentalist (CEnv).



Tadej Bregar  
InnoTecUK



**Tadej Bregar** holds two master's degrees, an MEng degree in Mechanical Engineering from University of Ljubljana and an MSc degree in Manufacturing Technology and Management from Cranfield University. During his academic years he has acquired broad experience in new product development, laboratory research and project management. Currently he is working as a project engineer at InnoTecUK with the responsibility of managing Innovate UK and EU Horizon 2020 projects.

## GRAPHOSITE Open Day 2019 – Partners and Participating organisations

### GRAPHOSITE Partners

#### ADVISE-DETA

Web: [www.advise-deta.com/en/](http://www.advise-deta.com/en/)



**ADVISE-DETA** is a recently formed SME that specialises in implementing advanced sensors to a wide range of material transformation processes, including polymer processing, composite materials manufacturing, mixing of chemicals and repair of structures. To this end, the company owns the IP (through transfer from ADVISE, Greece) of the dielectric monitoring system, which includes dielectric sensors, electronic measurement hardware and intelligent process monitoring software. The system has been installed in several industrial sites of advanced composites manufacturing. The business goal is to market the existing technology and establish new applications in modern manufacturing processes. The company's laboratory includes process characterisation methods (viscometer, optical microscope), dielectric measurement systems (frequency analyser, dielectric cure monitoring systems, material state based control prototype, temperature controlled sample holders) and software programming and modelling tools (LabView, Matlab).

## Brunel Composite Centre

Web: [www.twi-innovation-network.com/innovation-centres/brunel-composites-innovation-centre](http://www.twi-innovation-network.com/innovation-centres/brunel-composites-innovation-centre)



**Brunel Composite Centre** is part of the Institute of Materials and Manufacturing of Brunel University. The principal mission of BCC is to establish a world class research centre offering high quality research in phenomena that take place at the interface of composites to other materials. The physicochemical processes studies include processing of composites, embedding of smart structures in composites and joining of composites with other materials. BCC operates with the aim of developing a financially sustainable research facility, drawing on Brunel University's existing strengths, to complement and underpin the applied research and development activities of TWI.

## Cambridge Nanomaterials Technology Ltd (CNT)

Web: [www.cnt-ltd.co.uk](http://www.cnt-ltd.co.uk)



The **Cambridge Nanomaterials Technology Ltd (CNT Ltd)** is an innovation management and nanotechnology consulting company based in Cambridge. The CNT Ltd helps companies, academic and government institutions to develop world-class innovative solutions for nanomaterials related R&D and IPR strategy, partnership, products, technologies, funding and markets. CNT Ltd is specialised in carbon nanomaterials R&D consulting and collaborative R&D project management, including exploitation and dissemination management, consortium and supply chain building. CNT has done a number of patent landscaping and market research analysis studies regarding production and use of various nanomaterials helping to link inventors and technology developers with end-users and investors. The CNT Ltd is a leader of two private membership based consortiums: Nano-Carbon Enhanced Materials (NCEM) and the new Advanced Materials for Additive Manufacturing (AMAM) with members coming from leading multinational companies and research institutions.

## DZP Technologies

Web: [www.dzptechnologies.com/](http://www.dzptechnologies.com/)



**DZP Technologies** is a leading developer of specialty materials, formulations, and technologies for emerging industries. We work closely with our customers to create innovative materials for a range of markets, from consumer electronics and wearables, to 3D-printing and renewable energy. Founded in 2008, we work with forward-thinking businesses and enterprises to fast-track scientific discoveries and create advanced technologies for a wide range of markets. We are happy to take on the toughest technical challenges, using our expertise to help our customers develop innovative, sustainable products which offer a true differentiator in competitive markets.

## Haydale Composite Solutions Ltd

Web: [www.haydale.com](http://www.haydale.com)



**HAYDALE Composite Solutions** is an independent research and development company based in Loughborough, UK specialising in the development of advanced composites and nanomaterial enhanced composites and their applications. The company employs highly qualified engineers with mechanical engineering and material science backgrounds. The company has extensive knowledge of both thermosetting and thermoplastic based composites, manufacturing processes, structural design and applications across a broad range of industries. The company utilise the latest in computer aided design systems and have access to its own prototyping workshops. We are a global technology solutions company passionate about creating the next generation of advanced materials. We bring together cutting-edge technology with engineering know-how to enhance the performance of products and materials thus delivering business value for our customers.

## TWI

Web: [www.twi-global.com](http://www.twi-global.com)



**TWI** is one of the world's foremost independent research and technology organisations, with expertise in materials joining and engineering processes as applied in industry. TWI specialises in innovation, knowledge transfer and in solving problems across all aspects of manufacturing, fabrication and whole-life integrity management. Established in Cambridge, UK in 1946, the organisation has gained a first-class reputation for service through its teams of respected consultants, scientists, engineers and support staff. With around 800 employees, it works with over 1800 Industrial Member companies in over 70 countries. TWI currently operates from 54,000 square metres (581,000 square feet) of manufacturing, testing and training space; five UK and 13 overseas facilities serve both its Industrial Membership and its training and examination needs. A successful international Training and Examinations programme sees around 25,000 students trained each year in welding and inspection technologies.

## GRAPHOSITE Open Day 2019 - Participating Organisations

### BAE Systems



Web: [www.baesystems.com](http://www.baesystems.com)

**BAE Systems** is a global defence, aerospace and security company employing around 83,100 people worldwide. Our wide-ranging products and services cover air, land and naval forces, as well as advanced electronics, security, information technology, and support services.

### British Telecom



Web: [www.btplc.com/index.htm](http://www.btplc.com/index.htm)

**BT Group plc** is a British multinational telecommunications holding company headquartered in London, United Kingdom. It has operations in around 180 countries and is the largest provider of fixed-line, broadband and mobile services in the UK, and also provides subscription television and IT.

### Rolls-Royce plc.



Web: [www.rolls-royce.com](http://www.rolls-royce.com)

Employing over 40,000 people worldwide, **Rolls-Royce** is a global company providing highly-efficient integrated power and propulsion solutions. Our power systems are predominantly used in aerospace, marine, energy and off-highway applications. We are one of the world's leading producers of aero engines for large civil aircraft and corporate jets. We are the second largest provider of Defence aero engines in the world. Rolls-Royce is well established in the marine sector where we design vessels and integrate power systems. We have a growing presence in civil nuclear power, drawing on our skills and experience of over 50 years in powering nuclear submarines. Our MTU brand is world-renowned in high-speed diesel engines powering applications as diverse as rail locomotives and luxury yachts.

## Schlumberger Cambridge Research



Web: [www.cambridgetrust.org/partners/schlumberger-gould-research-centre](http://www.cambridgetrust.org/partners/schlumberger-gould-research-centre)

The **Schlumberger Gould Research** facility houses more than 930 m<sup>2</sup> of laboratory space and offices for more than 100 scientists and technicians. Research focuses on drilling, chemistry, fluid mechanics, and seismics. In each domain, SGR combines three strands of research: theory, experiment, and computational simulation. Research teams are multidisciplinary, embracing physics, chemistry, materials science, mathematics, statistics, earth sciences, solid and fluid mechanics, computer science, and instrumentation. Schlumberger works with the Cambridge Trust to offer the Schlumberger Cambridge International Scholarship, available to PhD applicants in subjects relevant to the work of the Schlumberger Gould Research Centre.

## Prysmian Group



Web: [www.prysmiangroup.com](http://www.prysmiangroup.com)

**Prysmian Group** is world leader in the energy and telecom cables and systems industry. With nearly 140 years of experience, sales of over €7.5 billion in 2016, 21,000 employees across 50 countries and 82 plants, the Group is strongly positioned in high-tech markets and offers the widest possible range of products, services, technologies and know-how. It operates in the businesses of underground and submarine cables and systems for power transmission and distribution, of special cables for applications in many different industries and of medium and low voltage cables for the construction and infrastructure sectors. For the telecommunications industry, the Group manufactures cables and accessories for voice, video and data transmission, offering a comprehensive range of optical fibres, optical and copper cables and connectivity systems. Prysmian is a public company, listed on the Italian Stock Exchange in the FTSE MIB index.

## MBDA



Web: [www.mbda-systems.com](http://www.mbda-systems.com)

**MBDA** is the only European group capable of designing and producing missiles and missile systems to meet the whole range of current and future needs of the three armed forces. A multi-national group with 10,000 employees working together across France, Germany, Italy, Spain and the United Kingdom. Offices also set up in USA. Jointly held by 3 prestigious shareholders: AIRBUS (37.5%), BAE Systems (37.5%) and Leonardo (25%).

## ARUP



Web: [www.arup.com](http://www.arup.com)

**ARUP** is a multi-disciplinary engineering firm, offering a variety of services across the built environment from planning to environmental consultancy and traditional SMEP engineering to specialist materials consulting. Operating with over 15,000 staff in 95 offices across 36 countries. We have had input to many landmark projects over the years including historically the Sydney Opera House or more recently Heathrow Terminal 5 to name but two.

## GoodFellow



Web: [www.goodfellow.com](http://www.goodfellow.com)

**Goodfellow** is a leading global supplier of metals, alloys, ceramics, glasses, polymers, compounds, composites and other materials to meet the research, development and specialist production requirements of science and industry.

With over 6000 customers supported by a worldwide network of offices, agents and distributors Goodfellow also offers a comprehensive range of bespoke processing services, effectively operating as an extension of the production team in order to develop custom fabricated components in any quantity required. Our in-house team is comprised of fellow scientists and engineers with extensive knowledge of materials and processing – through their technical expertise and a supporting range of specification tools the company has built an unrivalled reputation for helping to find solutions to even the most challenging of research problems. All of our products are also underpinned by the ISO 9001 quality accreditation.

## BITREZ



Web: [www.bitrez.com](http://www.bitrez.com)

**Bitrez** is a resin manufacturer that holds the UK's coveted Queen's Award for Enterprise in Innovation. We offer an extensive range of highly innovative materials developed for a broad range of markets. We work with a high standard of customer service and flexibility with controlled design, development and implementation programmes to give our customers the right solutions for their resin requirements. Founded in 1982, we have developed a reputation for providing quality products with exceptional service. We recognise that all requirements are unique and our team works hard to ensure that an outstanding package is provided. We endeavour for constant improvement, achieving this through training, integration and investing in our technology and staff.

## EMPA



Materials Science & Technology

Web: [www.empa.ch](http://www.empa.ch)

As an interdisciplinary research institute, **EMPA**, the **Swiss Federal Laboratories for Materials Science and Technology**, conducts cutting-edge materials and technology research. Its activities focus on the requirements of industry and the needs of society, and thus link applications-oriented research to the practical implementation of new ideas. Through an efficient technology transfer EMPA is turning research results into marketable innovations.

## Lucideon

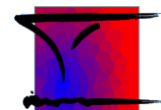


Materials Development and Commercialization

Web: [www.lucideon.com](http://www.lucideon.com)

**Lucideon** is a world leader in the field of Industrial Materials Sciences & Technology. Its business covers consultancy, contract R&D and testing & analysis. It is a well-known consultancy company with over 60 years history and employs over 200 professional scientists and engineers to serve worldwide clients with speed and simplicity to improve profitability and competitive position. Six major services are: Aerospace, ceramics, construction, healthcare, nuclear, power generation.

## The Nanoscience Centre University of Cambridge



Cambridge University nanofabrication and characterisation facility

Web: [www.nanoscience.cam.ac.uk](http://www.nanoscience.cam.ac.uk)



The **Nanoscience Centre** is an 1800m<sup>2</sup> research facility completed in January 2003 and located at the north east corner of the University's West Cambridge Site. The Centre provides open access to over 300 researchers from a variety of University Departments to the nanofabrication and characterisation facilities housed in a combination of Clean Rooms and low noise laboratories. Office space is primarily home to the Department of Engineering's Nanoscience Group, technical and administrative staff and members of other research groups who require long term access to facilities.

**University of Cambridge**  
**Department of Materials Science & Metallurgy**



Web: [www.msm.cam.ac.uk](http://www.msm.cam.ac.uk)

The **Department of Materials Science & Metallurgy** has a large and vigorous research school, with about 100 research fellows, postdoctoral scientists and visiting scientists, and more than 140 research students studying for the postgraduate degrees. The growth in our research activities over the past twenty years has been almost exponential, with a current research income of more than £10 million per year. Although our research has always been closely linked with industrial needs and supported in large part by industry as well as government, recent trends have seen the development of larger-scale working relationships with major research sponsors. Similarly, our wide range of international contacts which bring visiting researchers to Cambridge has been extended through formal collaboration agreements with institutions from around the world.

**University College London**  
Department of Physics and Astronomy



Web: [www.ucl.ac.uk/physics-astronomy](http://www.ucl.ac.uk/physics-astronomy)

**UCL** is a world-leading university situated in the heart of London, UK. UCL was 1st in the UK for research strength at the last UK university research assessment (UK REF 2014). ~40,000 undergrad+post grad students, ~7,000 Staff. The Physics and Astronomy Department at UCL is located in the heart of the historical area of Bloomsbury. Scientific research and study has been a strong feature of UCL since its inception in 1826 and the Department is one of the top rated Physics departments in the country and the world.

**University of Surrey**  
**Advanced Technology Institute**



Web: [www.surrey.ac.uk](http://www.surrey.ac.uk)  
[www.surrey.ac.uk/ati/about](http://www.surrey.ac.uk/ati/about)

**The Advanced Technology Institute at the University of Surrey** is an interdisciplinary research centre dedicated to advancing next-generation electronic and photonic device technologies. Our strategy is based on having selective and focussed programmes of research, each of critical mass, which embrace in their investigations the full spectrum of fundamental science through to applied engineering. From our contributions to the design of the first strain layer laser in the mid 80's to rapid thermal annealing and production of SIMOX for semiconductors in the 90's to nano-materials and nano-technologies in the last decade; our researchers have been at the forefront in helping to solve some of the most challenging problems in industry today. We are also examining such issues as the fabrication of cheap renewable energy sources, and work with industry to deliver high quality output wherever it is required. Presently, there are some 160 researchers working in the AT

**Bridon-Bekaert Ropes Group**



Web: [www.bridon-bekaert.com](http://www.bridon-bekaert.com)

**Bridon Bekaert Ropes Group** is a world leading manufacturer and service provider of wires, cords, steel ropes and synthetic fibre ropes. Headquartered in Doncaster with 2,500 employees and ~20 manufacturing factories and service sites worldwide, Bridon Bekaert Ropes Group has three technology centres with the largest one based in Doncaster UK.

## E.G.O. Elektro-Gerätebau GmbH



Web: [www.egoproducts.com/en/home](http://www.egoproducts.com/en/home)

**E.G.O.** is an international high-tech company and one of the leading global manufacturers of domestic appliance technology, components and products. Other industries, ranging from medical technology through building services to automotive technology, benefit from our pioneering spirit, our experience and our expertise. Ever since the company was founded in 1931 we have been inventing sophisticated technology that makes people's day-to-day lives easier. Carrying on this tradition is what drives us on each and every day.

## Versarien™ plc (Headquarters)



Web: [www.versarien.com](http://www.versarien.com)

At **Versarien**, we utilise proprietary materials technology to create innovative engineering solutions that are capable of having game-changing impact in a broad variety of industry sectors. Founded in 2010, we have continued to develop advanced materials and processes to satisfy customer-specific applications whilst expanding our portfolio of intellectual property through acquisition. Our product offerings are capable of having a game-changing impact in a broad variety of industry sectors.

## Innovia Technology



Web: [www.innoviatech.com](http://www.innoviatech.com)

**Innovia Technology** is an innovation consultancy specialising in the front end of innovation, working with the best companies in the world to create opportunities for growth.

## InnoTecUK



Web: [www.innotecuk.com](http://www.innotecuk.com)

**InnotecUK** is a dynamic, fast growing and progressive robotics and automation solution provider, specialising in development of innovative and novel robotic systems to overcome complex sensing, measurement, control, automation and inspection challenges. InnotecUK has a diverse client base and has strong partnerships in Ireland, UK and Asia in sectors including conventional power generation, oil & gas, nuclear, renewable energy, chemical, food processing, and maritime. InnotecUK focuses on delivering client-led solutions to maximise life-cycle production asset values. It develops and markets novel mechatronic systems to overcome complex equipment and asset inspection challenges in hazardous and difficult to access environments. The ability to deliver value and technical excellence under harsh operating conditions has been central to success.

## BSI Group

Web: [www.bsigroup.com/en-GB](http://www.bsigroup.com/en-GB)



**BSI** is the business standards company that helps organizations all over the world make excellence a habit. For more than a century we have been challenging mediocrity and complacency to help embed excellence into the way people and products work. That means showing businesses how to improve performance, reduce risk and achieve sustainable growth. As a global leader in helping organizations improve, our clients range from high profile brands to small, local companies in 182 countries worldwide.

## Exemplas Ltd

EEN East of England

Web: [www.exemplas.com](http://www.exemplas.com)



**Exemplas** are pioneers of business advisory services in the UK. Exemplas help small businesses and organisations to enhance their value proposition and benefit their markets.

## Q5D

Web: [q5dtech.com](http://q5dtech.com)



**Q5D** is an innovative technology company developing tools to automate the production of wiring harnesses for the consumer white and electronics, through to the automotive and aerospace markets.

## ANSYS Granta

Web: [www.grantadesign.com](http://www.grantadesign.com)



**Granta** is the leader in materials information technology – software, information resources, and services to advance materials education, and to enable better, greener, safer products. Granta Design is a subsidiary of ANSYS Inc.

## Reflex Imaging

Web: [www.reflex-imaging.com](http://www.reflex-imaging.com)



**Reflex Imaging** was formed in 2013 with a mission to bring to market products based on its unique technical innovations and patent portfolio. The company is based in Horsham, West Sussex in the UK. The company focuses on design and development, partnering with established suppliers for manufacturing and distribution.

## National Composites Centre

Web: [www.nccuk.com](http://www.nccuk.com)



The **National Composites Centre** is a world-class research centre, where companies of any size and across industry sectors, can access cutting-edge technology and specialist engineers, to drive innovation in the design and manufacture of composites.

## Non-metallic Innovation Centre

Web: [www.non-metallic.com](http://www.non-metallic.com)



Saudi Aramco Technologies Company (AramcoTech), TWI and ADNOC, have come together to form the **Non-metallic Innovation Centre (NIC)**, a private technology innovation partnership. NIC will connect AramcoTech & ADNOC with composites manufacturers, academic institutions and industrial partners wanting to make an impact on the oil and gas industry, and beyond. As a multi-stakeholder centre based at TWI in Cambridge, NIC will conduct a research programme covering technologies with different maturity levels spread through Technology Readiness Levels (TRL) 1-9. Partners are drawn from leading academic institutions, research centres and composite material manufacturers.



## Printed Electronics

Web: [www.printedelectronics.com](http://www.printedelectronics.com)



**Printed Electronics** are experts in functional printing, material deposition, inkjet and digital technologies focussing on electronic applications. We supply training, product and process development for companies, universities and research organisations all around the world.

## Teledyne CML Composites

Web: [www.teledynecml.com](http://www.teledynecml.com)



**Teledyne CML Composites** based in Bromborough England provides a comprehensive manufacturing service for composite products in advanced engineering applications, including components and assemblies for aircraft structures and systems. Teledyne CML Composites is integrated with the Marine and Aviation Manufacturing business unit of Teledyne Brown Engineering which brings with it extensive expertise and experience in design, product development and engineering support. With a strong pedigree in manufacturing machined and fabricated metallic components for the aerospace industry since the 1940's, Teledyne CML Composites are now focused on the manufacture and supply of composite components from details through to complete sub-assemblies or kits of parts. Operating out of a brand new state of the art facility opened by HRH Prince Andrew in 2011, Teledyne CML Composites can supply the complete Turnkey package, from engineering, lay-up, curing, CNC machining, assembly, paint and NDT. With the added bonus of having metal fabrication and machining capability in-house Teledyne CML Composites can offer a "one stop shop" for the customer looking for a complete composite manufacturing solution.

## Brunel Innovation Centre (BIC)

Web: [Brunel.ac.uk/bic](http://Brunel.ac.uk/bic)



The **Brunel Innovation Centre (BIC)** is a world class research and technology centre that sits between the knowledge base and industry offering high quality research in an innovative environment focused on non-destructive testing, condition and structural health monitoring, power ultrasonics and allied technologies covering a range of materials, sensors, electronics and software systems supporting partners in industry to transfer academic research into industrial application. BIC has 35 staff members. BIC pursues initiatives that span national and international platforms including Innovate UK, EPSRC and EC. The Centre has been building a strong portfolio of projects in line with its multinational interdisciplinary vision. Core Areas: State-of-the-art power ultrasonic systems for inspection and cleaning; Smart non-destructive testing; Condition and structural health monitoring; Advanced signal and image processing algorithms including machine learning; Numerical modelling and fluid structure interaction; Novel and robust sensing for harsh environment (e.g high temp transducers up to 600 °C); Digital twin technology; IoT and data analytics.

## University of Sheffield Advanced Manufacturing Research Centre (AMRC)

Web: [amrc.co.uk](http://amrc.co.uk)



**AMRC** specialises in carrying out world-leading research into advanced machining, manufacturing and materials, which is of practical use to industry. Our 110-plus industrial partners range from global giants like Boeing, Rolls-Royce, BAE Systems and Airbus to small companies. Businesses can work with us on a one-off project, or join us as a member for long-term collaboration. The AMRC now employs over

500 highly qualified researchers and engineers from around the globe, on the Advanced Manufacturing Park and Sheffield Business Park in South Yorkshire, as well as in Broughton and Preston.

## Marshall Aerospace and defence group



Web: [marshalladg.com](http://marshalladg.com)

**Marshall Aerospace and defence group** – 1,800 employees, £321m turnover. Industry – Aerospace and defence incorporating Military aerospace, Land systems, Aerostructures, Advanced composites, Major projects, Aeropeople business units. Main activities – design, maintenance, manufacture, repair of complex systems for military applications e.g. auxiliary fuel management systems for aerospace, large composite marine structures, special missions aircraft platforms, deployable military shelters.

## Uniper Technologies Ltd.



Web: [www.uniper.energy](http://www.uniper.energy)

**Uniper** is a power generation company comprising 14,000 employees worldwide. Uniper Technologies Ltd., based near Nottingham, provides a wide range of energy services to the industry and beyond. Services include inspection, materials analysis and failure investigations, structural assessment, condition monitoring, electrical power and networks, environmental sciences, vendor assessments, etc.

## Ultra Electronics, Precision Control Systems

Precision Control Systems



Web: [www.ultra-pcs.com](http://www.ultra-pcs.com)

**Ultra Electronics Precision Control Systems** is a division of Ultra Electronics that mainly serves the Aerospace industry with safety critical, high integrity electronic, electro-mechanical and pneumatic systems. Ultra's main technology areas include position sensing and control, ice protection and noise & vibration.