

Ultra**MAT** Open Day 2019

Innovate UK Project

UltraMAT - Power ultrasound as a generic tool for
micro/nanoscale processing of metals

www.UltraMAT.co.uk

Agenda

Speakers and Participating Organisations

Date: 7th March 2019

Venue: Hughes Hall College
Cambridge, CB1 2EW



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NANOMATERIALS
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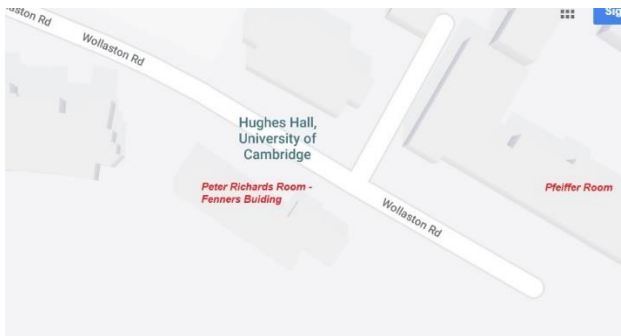
CEDAR
METALS
LIMITED



UltraMAT Open Day 2019

The **UltraMAT** Open Day will be taking place in Cambridge on the **Thursday 7th March 2019** at:

Peter Richards Room
 Fenners Building
 Hughes Hall College
 Cambridge,
 CB1 2EW
 Tel: +44 (0) 1223 334 898
<https://www.hughes.cam.ac.uk/>

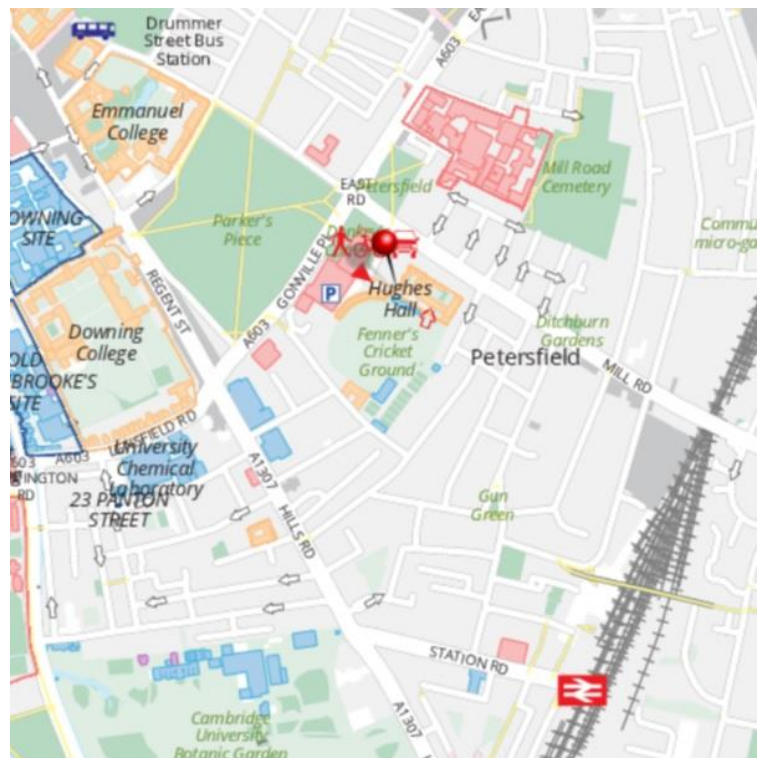


Pfeiffer Room (lunch venue)

Parking

Unfortunately Hughes Hall has very limited car parking spaces, however due to its location, it has very convenient access to **Queen Anne Terrace Car Parking**

(<https://www.cambridge.gov.uk/queen-anne-terrace-car-park>) - Gonville Place, Cambridge, Cambridgeshire, CB1 1ND.



Power ultrasound as a generic tool for micro/nanoscale processing of metals

UltraMAT

UltraMAT is a project funded by Innovate UK (Ref. No. 102802) with an objective to develop a novel generic technology for materials processing of fluid and semi fluid phases that are widespread in manufacturing including welding and adhesive joining components and manufacturing of bulk composite components with nanomaterials additives such as carbon nanotubes and graphene.

UltraMAT project partners: Innovative Technology & Science Ltd (InnoTecUK), Brunel Innovation Centre (BIC), TISICS Ltd, KW Special Projects Ltd, NquiringMinds Ltd, Carrs Welding Technologies Ltd, Cambridge Nanomaterials Technology Ltd and Cedar Metals Ltd.

UltraMAT Open Day is the first opportunity to meet the project partners and get introduced to the project.

www.UltraMAT.co.uk

Agenda

Meeting & exhibition venue: Peter Richards Room,
Lunch venue: Pfeiffer Room
Hughes Hall
Cambridge

10:15 Arrival and registration (exhibition)

10:30 Welcome and UltraMAT Open Day Introduction

Dr Bojan Boskovic, Managing Director, Cambridge Nanomaterials Technology Ltd (CNT)
UltraMAT Open Day 2019 Organiser
UltraMAT Project Exploitation Manager

10:50 Overview of the UltraMAT Project

Menelaos Ioannidis, Commercial Project Manager, Innovative Technology & Science Ltd (InnoTecUK)
UltraMAT Project Coordinator

11:10 Ahmed Teyeb, Brunel Innovation Centre

Title: Ultrasonic Assisted Material Processing for Aerospace and Automotive Industry.

High-performance materials are broadly applied in many key industries to meet the high requirements of material strength, light weight, corrosion resistance, high-temperature capability, functionality, etc. Manufacturing of high-performance materials is necessary to

produce the end-use parts or components that can be effectively applied in industries. However, traditional manufacturing methods could generate various manufacturing problems, which would limit the broad applications of end-use parts. As a type of high-performance materials, Glass Laminate Aluminum Reinforced Epoxy (GLARE) and Carbon Fiber Reinforced Plastic (CFRP) composites have found remarkably increasing applications in the aerospace and automotive industries due to their superior properties. Also welding of non-laser weldable alloys are of interest across many industries. However, fabrication defects and uncertain microstructures are inevitably induced in these manufacturing processes *i.e.* porosities, wider heat affected zone, agglomeration. These are greatly detrimental to the part qualities and mechanical properties. Based on the problems during the manufacturing of high-performance materials as mentioned above, it is thereby of great significance to develop a high-quality and high-efficiency manufacturing technique to effectively reduce the issues. Compared with other mechanical vibrations, ultrasonic vibration possesses a frequency that is much higher than the natural frequency of a system. Due to this reason, ultrasonic vibration can maintain or even improve the stability of the manufacturing system without adding harmful low-frequency vibrations. In this project, ultrasonic vibration-assisted manufacturing processes will be thus conducted to seek the potential solutions for the aforementioned manufacturing problems.

11:30 Stephen Kyle-Henney, Managing Director, TISICS Ltd.

Title: Metal Matrix Composites

TISICS Ltd is a Farnborough based SME specialising in silicon carbide monofilament production and the development of continuously fibre reinforced metal matrix composite (MMC) materials. These next generation materials offer huge potential for weight saving in critical space and aerospace applications. The technology has historically been limited to R&D but the company is currently pushing towards commercialising in some of the more promising markets. To aid this activity, were always evaluating alternative technologies to aid manufacturability or cost savings. Our MMC manufacturing processes could potentially benefit from the capabilities of power ultrasound. At the same time, we are working with the other programme partners towards producing an enhanced GLARE material which should enable enhanced performance from incorporation of MMC in the metallic layers and application of power ultrasound to control nanoparticle reinforcement in the polymer resin during the infusion process.

11:50 Stuart Banyard, Head Advanced Manufacturing, KW Special Projects Ltd.

Title: UltraMAT a novel process for polymer composites

12:10 Dr Nick Allott, CEO and Co-Founder, NquiringMinds Ltd & Dr Alex Mereacre, Systems Engineer, NquiringMinds Ltd.

Title: Secure Cognitive Architectures with Practical Industrial and Manufacturing Application

Many cutting edge manufacturing applications generate vast volumes of data. This data, if managed and analysed effectively can transform and optimise manufacturing processes. The potential is rarely realised. The typical challenges which prevent this are: an ability to process the speed and volume of data generated, concerns about the security implications of attaching connected sensors to valuable engineering equipment and lack of technical infrastructure and analytics capability to process the data. In the context of Ultramat, which looks a novel applications of ultrasonics in carbon nanotube adhesion scenarios, we review the requirements and demonstrate how a well defined sensor, analytics and security architecture can be effectively deployed

12:30 Dr Weiwei Wang, Principal Engineer, Innovative Technology & Science Ltd (InnoTecUK).

Title: UltraMAT System Integration



InnoTecUK is a dynamic and progressive research and innovation company specialising in the development and commercialisation of novel solutions to overcome complex societal challenges. Their business is focused on UK and EU R&D projects, automated NDT robotic products and worldwide consultancy service. InnoTecUK brings their ultrasonic system integration and knowledge transfer expertise to UltraMAT project and plans to take a successful UltraMAT prototype from TRL 6 at the end of the project to TRL 9 with further work by 2023.

12:20 John Silva, Technical Quality Manager, Carrs Welding Technologies Ltd.
Phil Carr, Director, Carrs Welding Technologies Ltd

Title: Introduction to Carrs Welding and its role in the project

12:40 Exploitation and Dissemination activities of the UltraMAT project

Dr Sofia Billett, Senior Innovation Consultant, Cambridge Nanomaterials Technology Ltd.

David Rowe, CEO, Cedar Metals Ltd.

Title: Introducing Cedar Metals Ltd.

13:00 Lunch break and networking – Pfeiffer Room

14:10 Exhibition and networking – Peter Richards Room

Presentations from Guest speakers:

14:30 Dr Matthew Thornton, Senior Manager, Haydale Graphene Industries PLC, UK

Title: Creating Material Change: The use and applications of Advance Materials including Graphene

15:00 Michael Edwards, Business Director Advanced Materials, Thomas Swan, UK

Title: Nano-carbon materials development and production at Thomas Swan.

15:30 Coffee break and exhibition

16:00 Sofia Sampethai, Project Leader at TWI Ltd, UK

Title: Introduction to the GRAPHOSITE - A Graphene Sensor for Defect Detection and Predictive Maintenance in Composite Materials – Project

15:15 Dr Harry Cronin, R&D Manager, DZP Technologies Ltd., UK

Title: Introduction to DZP Technologies Ltd. – Advanced materials and applications development for printable electronics.

DZP Technologies is a leading developer of specialty materials, formulations, and technologies for printed and large area electronics. In this talk the capabilities of DZP Technologies will be introduced in the areas of ink formulation, conductive printing and coating, printed sensors and

related application development work. Our involvement in a number of publicly funded R&D projects and consortia, including GRAPHOSITE, will be introduced.





16:30 Panel Discussion – Development of Advanced Materials in the UK.

Facilitated by **Dr Bojan Boskovic**, CEO, Cambridge Nanomaterials Technology Ltd.





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 **UltraMAT Exploitation and Dissemination Manager** Dr Bojan Boskovic on info@ultrammat.co.uk or Bojan.Boskovic@CNT-Ltd.co.uk or on his mobile phone +447780874335.*

Speakers and UltraMAT project partners

	<p>Dr. Bojan Boskovic Cambridge Nanomaterials Technology Ltd Email: Bojan.Boskovic@cnt-ltd.co.uk info@ultrammat.co.uk Web: www.CNT-Ltd.co.uk</p>	
<p>Dr Bojan Boskovic 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,. 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 a private Nano-Carbon Enhanced Materials (NCEM) consortium</p>		
	<p>Dr Sofia Billett Cambridge Nanomaterials Technology Ltd Email: sofia.billett@cnt-ltd.co.uk Web: www.CNT-Ltd.co.uk</p>	
<p>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.</p>		
<p>Cambridge Nanomaterials Technology (CNT) Ltd is a nanomaterials innovation, management and technology consulting company based in Cambridge, UK. CNT leads two private consortiums: NANO-CARBON ENHANCED MATERIALS (NCEM) and ADVANCED MATERIALS FOR ADDITIVE MANUFACTURING (AMAM). CNT is providing various customised services related to scientific technology and IP development strategy to companies and government organisations and it is involved in exploitation and dissemination activities in a number of European H2020 and UK projects</p>		
<p>ROLE IN PROJECT: CNT is leading exploitation and dissemination activities of the UltraMAT project. CNT is in charge of the project website (www.ultrammat.co.uk), leaflets, workshops, Intellectual Property (IP) strategy, and preparation of patent landscaping reports. We are also involved in market research, business development and exploitation strategy of the project.</p>		



	<p>Menelaos Ioannidis InnotecUK Email: Menelaos.ioannidis@innotecuk.com projects@innotecuk.com Web: http://www.innotecuk.com/</p>	
<p>Menelaos is an expert Commercial Project Manager with a BSC in International and European Studies (International & European Economics). Menelaos has extensive experience of managing and coordinating high budget EU & UK research projects, negotiating research contracts and identifying new funding opportunities.</p>		
	<p>Dr Weiwei Wang InnoTecUK Email: weiwei.wang@innotecuk.com Web: http://www.innotecuk.com/</p>	
<p>Dr. Weiwei Wang is a principal engineer at InnoTecUK with extensive mechanical and software experience in development of high precision scientific instruments and industrial product design. He completed his MEng degree in materials science and his PhD in the school of engineering and physics at the university of Edinburgh. He is an expert at designing and developing remote control robotic crawlers for NDT measurements in inaccessible or hazardous environments, and bespoke scientific instruments for studying physical properties of materials at extreme conditions.</p>		
<p>InnoTecUK is an experienced, dynamic and progressive robotics and automation solution provider. Our speciality is Development and Commercialisation of innovative and effective Industrial Robotic Systems to overcome complex challenges.</p>		
<p>Our extensive expertise, industrial engagements and commitment to excelling has allowed us to develop a number of prototypes and state of the art solutions for inspecting complex components, infrastructure and high value assets.</p>		
<p>ROLE IN PROJECT: InnoTecUK is the Project Coordinator. It is working, along with NQM and BIC in the integration of the hardware/software of the project.</p>		

	<p>Mr. Jamil Kanfoud Brunel University London Email: Jamil.Kanfoud@brunel.ac.uk Web: https://www.brunel.ac.uk/</p>	
<p>Jamil Kanfoud received the Master's degree in general engineering from l'Ecole Polytechnique de Tunisie, Tunisia, and the M.Phil. degree in numerical modelling from l'Universite´ de Technologie de Compie`gne, Compie`gne, France. He is the head of with the Brunel Innovation Centre, Uxbridge, U.K. Before joining Brunel University, he worked on modelling and optimizing a novel porous noise cancelling solution for the Ariane V launcher fairings using BIOT-Allard theory. He has five years 'academic experience, including two years heading the Electromechanical Department, ESPRIT. At TWI, he worked on active and passive vibration damping, and developed condition and structural health monitoring strategies and technologies for aerospace, renewable energy, and oil and gas using techniques ranging from vibration to acoustic emission. Since joining Brunel University, he has been working on developing research areas in nondestructive testing and condition monitoring including the development of novel sensing techniques (plenoptic cameras), the adoption of machine learning for inspection, and monitoring applications. He has a track record of proposing and managing collaborative projects and building strategic partnerships with industrial partners to increase technology readiness level of novel technologies in the field of structural integrity.</p>		
	<p>Mr. Ahmed Teyeb Brunel University London Email: ahmed.teyeb@brunel.ac.uk Website: https://www.brunel.ac.uk/</p>	
<p>Ahmed Teyeb holds a master degree of engineering and an MPhil in Instrumentation and measurements from l'Institut National des Sciences Appliquées et de Technologies INSAT de Tunis. He has a two year industrial experience and he was working on the study and implementation of projects in the areas of instrumentation and control, electricity,</p>		



and preventive maintenance. Ahmed has spent 11 year as a lecturer within several academic institutions where he had been teaching classes and supervising students' graduation projects in the fields of instrumentation and sensors, automation and electrical engineering. He had also been leading a team of 10 faculty members for 4 years while working on gradual migration to active learning, accreditation process of the engineering degree, development and updating of curricula for 4 years.

His research background focuses on instrumentation, data acquisition and sensors' development. He worked on several projects such as design and characterization of bio-chemical sensors based on Photonic Crystal Optical Fiber, ECG and oximetry sensing and acquisition, automatic irrigation systems and field parameters acquisition, sensing and power drives application. Ahmed joined Brunel Innovation Centre in March 2017 as research fellow working on projects related to data acquisition and sensors development.

Brunel Innovation Center (BIC) is part of the Institute of Materials and Manufacturing of Brunel University. BIC was founded in 2009 in collaboration between Brunel University London and TWI, and is based in Granta Park, Cambridge.

The research carried out at BIC is predominantly in the field of NDT, CM, SHM, Power Ultrasonic and related areas, including:

- SHM / CM (Acoustic emission & ultrasonic guided waves)
- Ultrasonic Cleaning / De-icing / Material Processing
- Smart NDT (automation, wireless, IMUs)
- Sensors and transducers (aggressive environments; high temperature)
- Signal / Image Processing/Machine learning
- Systems (hardware-software) integration

ROLE IN PROJECT: BIC is s involved in the characterisation of power ultrasonic technology to assist laser welding processing and metal composite manufacturing process.



Stephen Kyle-Henney
 Managing Director
 TISICS
 Email: skylehenney1@tisics.co.uk
 Web: <https://www.tisics.co.uk/>



I am managing Director of TISICS limited. I have been working on metal matrix composites since my materials degree 30 years ago. My technical experience covers all aspects of the fibre and composite design and fabrication processes. Since forming TISICS in 2005 to buy the technology from QinetiQ, I have focused on component design and technical strategy to develop the commercial opportunities for MMCs and address the issues needed to industrialise the technology in the UK. This work has provided a great opportunity to gain a better understanding of the needs for high performance materials in space, aerospace, sub-sea oil and gas and power generation where light weighting and corrosion resistance offer major cost savings to users. I have also had the opportunity to visit a number of automotive and defence customers with some very challenging demands for our materials.

TISICS develops light weightceramic fibre reinforced Titanium and Aluminium alloys for high performance systems where strength, mass, corrosion resistance and temperature properties can be exploited, with partners in the space, aerospace, defence, automotive and energy sectors.

ROLE IN PROJECT: TISICS is leading the UltraMAT system integration and implementation



Stuart Banyard
 KWSP
 Email: stuart.banyard@kwspecialprojects.com
 Web: <https://kwspecialprojects.com/>



Stuart has over 20 years' experience as a manufacturing engineer across a variety of sectors. His expertise spans all areas of additive ('3D printing') and composite manufacturing process for clients in motorsport, automotive, defence, marine and aerospace. Stuart is responsible for delivery of KWSP's Composite and Additive Manufacturing services as well as advising programmes on any advanced manufacturing requirements.

KWSP is a high-performance engineering team that uses the capabilities and technologies of the motorsport industry to provide turnkey engineering programme delivery, from concept to manufacturing & assembly to multiple sectors.



Key to KWSP's approach is the use of digital manufacturing techniques such as Additive Manufacturing ('3D Printing') that facilitate bespoke solutions to engineering challenges.

ROLE IN PROJECT: KWSP leads the work on the outline of the functional design of the UltraMAT tool and experiments.



Phil Carr
Carrs Welding
Email: pc@carrswelding.co.uk
Web: <http://carrswelding.co.uk/>



Phil has over 30 years of experience in and around welding; conventional welding, systems building and now laser application dedicated job shop. He has been Director of Carr Welding for over 17 years. He got a BSc Electrical and Electronic Engineering., Power Electronics, from the University of Newcastle.



John Silva
Carrs Welding
Email: john@carrswelding.co.uk
Web: <http://carrswelding.co.uk/>



Innovative qualified Mechanical Engineer with a strong desire to establish a progressive career and to develop his expertise in new concept development, simulation and validation within a forward thinking company based in UK or Portugal. Experienced in Quality Management and Quality Assurance.

Carrs started in business repairing and refurbishing mould tools in 1992; in the late 90's we started investing heavily in laser welding equipment and most people in the industry consider us to be at the very cutting edge of the technology. As a result our business has expanded and diversified considerably, but we still carry out a multitude of tool repairs every week for our valued mould customers on three of our laser stations dedicated to breakdowns and jobs requiring rapid turnaround on an immense variety of sometimes exotic metal components.

ROLE IN PROJECT: Carrs is involved in the testing on samples with comparison of ultrasonically processed samples with benchmark samples prepared without ultrasound.



Dr Nick Allott
Nquirigminds Ltd
Email: nick@nquirigminds.com
Web: <http://nquirigminds.com/>



Nick is the founder of NquirigMinds, one of the UKs most promising AI startups. He is former CTO of an international security standards body, a US VoIP startup and former Director at Motorola. Nick has a Degree in Cognitive Science from Nottingham University, and a PhD in Artificial Intelligence. He is an Advisory Board Member for VisionMobile and a Member of TechUKs CTO Council



Dr Alex Mereacre
Nquirigminds Ltd
Email: mereacre@nquirigminds.com
Web: <http://nquirigminds.com/>



Alexandru has degrees in Electrical Engineering and Computer Science. He also has a PhD in Computer Science from RWTH Aachen University, Germany. He worked a number of years for Oxford University as a researcher in formal methods and model-based design of medical devices.

He has a wide experience in developing software and hardware for automotive, security and medical device applications. Alexandru has designed for a number of years high precision measuring devices for automotive and gas industries. He has also worked in the material testing industry where he designed algorithms that analyse the failure of pressure vessels, building structures and pipes.

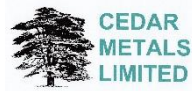


nquiringminds are experts in AI, IOT and CyberSecurity.
 nquiringminds is seven years old, organically grown and owns all the core IP. We have real world customers in sectors as diverse as SmartCities, Industry 4.0, Defence, Agriculture, Telecoms and Health and Social Care.

ROLE IN PROJECT: **NquiringMinds** is developing the tool operating software for the project.



David Rowe
 CEO
 Cedar Metals Ltd.
 Email: david.rowe@cedarmetals.co.uk



After a career of over 40 years in the metallurgical processing industry, **David Rowe** (Eur.Ing. C.E.D Rowe B.Sc. C.Eng. C.Sci. FIMMM, FWeldI) formed Cedar Metals Ltd. in 2004, a metallurgical consultancy company specialising in non-ferrous metals and rare earths from ore to fabricated products in particular refractory metals and corrosion resistant materials for the Aerospace, Defence, Chemical, Electronic, Furnace, Oil and Gas, Nuclear and Glass industries, general powder metallurgical processes including MIM, friction stir welding of steel and the use of advanced ultrasonics in the non-invasive cleaning of pipes and valves in the Oil & Gas and Chemical Process Industries.

Cedar Metals is a limited company specialising in data and patent literature searches and provide confidential technical assistance to various industries using knowledge and experience gained in over 40 years working in industry before forming Cedar Metals Ltd in 2004.

ROLE IN PROJECT: **CEDAR** is the partner in charge of literature review for the project, as well as providing advice on the metallurgical processes.

Guests Speakers



Matthew Thornton
 Senior Manager
 Haydale
 Email: matthew.thornton@haydalecs.com
 Web: <https://www.haydale.com/>



Matthew has a BSc (Hons) in Chemistry with Chemical Engineering and a PhD in Materials Science and Engineering, researching the Catalytic Deposition of Carbon Nanotubes on 3D Carbon Fibre Supports carried out in collaboration with Meggitt Aircraft Braking Systems.

Following various roles with academia, government bodies and industry, working with polymers, composites and nanomaterials, Matthew joined Haydale Composite Solutions in April 2016 and is responsible for the management of a range of nanocomposite materials research, development and manufacturing programmes in both the commercial and grant funded sectors.

Haydale is a global technology solutions company passionate about creating the next generation of advanced materials. We have an established, secure and validated supply chain of graphene and nanomaterials with centres of expertise in the key growth markets around the world.

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.
 Innovation underpins everything we do.



Michael Edwards
 Thomas Swan Chemicals – Advanced Materials Division
 Email: medwards@thomas-swan.co.uk
 Web: www.thomas-swan.co.uk



After graduating in 1979 with a BSc (Hons) Electronics w/Physics (2/1) from UWIST, Cardiff he worked on the digital design and microcode of the Ferranti F100L microprocessor achieving Chartered Engineer (CEng) status with the IEE. A 15-year career at Toshiba Electronics followed, joining the company as Applications engineer where he established the European ASIC Design Centre, managed the European Memory Business introducing Flash Memory



to Europe and presided over Toshiba's #1 Memory supplier status, finally running Toshiba's UK components business as General Manager of a £400M/120 staff company in his last 4 years.

Since 2000, he has held various global sales, marketing and director roles in a number of start-up companies, namely SMART Modular Technology, Antenova, Oxford Advanced Surfaces where he was an AIM Director and most recently as Cambridge Nanotherm Ltd before joining Thomas Swan as Business Director of the Advanced Materials Division in September of 2018.

Founded in 1926 in Consett, in the North East of England, **Thomas Swan** today produces over 100 performance and speciality chemicals and offers an experienced and flexible manufacturing service.

Our values have helped us become an international company, offering a world-class product and service capability. Thomas Swan & Co. Ltd. is an independent chemical manufacturing company with a global network of distributors. With offices and warehousing in the UK, USA and China, we service the domestic and international markets and export to over 80 countries worldwide.



Sofia Sampethai
Project Manager
TWI Ltd.
Email: sofia.sampethai@twi.co.uk
Web: <https://www.twi-global.com/>



Project Manager with 3 years of experience in Nanotechnology, synthesis of nanomaterials and materials processing. She is an expert in clean room synthesis of carbon nanotubes, chemical vapor deposition, controlled synthesis of carbon nanotubes after her three years spent at the Swiss Federal Institute of Technology in Zürich. She focused on verification of carbon nanotubes incorporation into sensors using Raman spectroscopy and controlled and targeted growth of carbon nanotubes by introducing mass spectrometry. She has managed technically and financially more than 10 collaborative projects and she is working on the development of new opportunities towards nanotechnology, condition and structural health monitoring and fitness for service. Finally, she has a strong theoretical understanding in Micro Electro Mechanical Systems (MEMS), Materials Science, Thermodynamics, Polymer Physics, Process Design and Safety and Vibration Analysis.

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.



Dr Harry Cronin
DZP Technologies Ltd.
Email: harry.cronin@dzptechnologies.com
Web: www.dzptechnologies.com



Harry Cronin is R&D Manager for DZP Technologies Ltd. Harry received his doctorate in materials science from the University of Surrey in 2018 working on printable electronic materials for solar cells. Since then he has been working on a range of research and product development projects for DZP Technologies in areas including printable conductors, graphene and sensors.

DZP Technologies is a small company which develops specialty ink formulations and processes for printed flexible electronics, 3D electronics, electronic textiles, and energy storage. We offer a range of products including conductive silver and carbon inks, conductive adhesives, graphene inks and pastes, thermal materials, and various customised formulations. Our company is renowned for its water-based, zero-VOC (volatile organic compound) inks which have low environmental impact, in addition to significantly reduced manufacturing and compliance costs.



Other Participating Organisations

BAE Systems



Web: 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.

Rolls-Royce plc.



Web: <https://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.

Bitrez Limited



Web: www.bitrez.com

100 employees, R&D focused formulator and manufacturer of high performance Thermoset Polymers and Resins, including Epoxy, Phenolic, Vinyl Ester, Benzoxazine as well as complimentary curing agents and catalysts for the Coatings, Composite and Adhesives sectors.

Brunel Composite Centre



Web: <http://www.twi-innovation-network.com/innovation-centres/brunel-composites-innovation-centre/>

Brunel Composites Centre is part of the Institute of Materials and Manufacturing of Brunel University

- Principal mission is to establish a world class research centre offering high quality research
- Various ongoing research on the phenomena that take place at the interface of composites to other materials and physicochemical processes studies including processing of composites, embedding of smart structures in composites and joining of composites with other materials.

Cranfield University



Web: <https://www.cranfield.ac.uk>

Cranfield, is an exclusively postgraduate University that is a global leader for education and transformational research in technology and management. Cranfield teaches 4,500 postgraduate students each year and employs 1,500 academic and support staff.

Main activities: Research and Education



GoodFellow

Web: <http://www.goodfellow.com/>



Supplier of Metals, Alloys, Ceramics, Polymers, Compounds, Intermetallics & Composites for research & industrial markets.
Company size: 51-200 employees

MBDA UK Limited

Web: www.mbda-systems.com



MBDA UK Ltd is an established world leader in missiles and missile systems and part of a multi-national group with over 10,000 employees located in the UK, France, Italy, Germany and the United States. MBDA has three major aeronautical and defence shareholders – BAE Systems (37.5%), EADS (37.5%) and Leonardo (25%).

Metiscube Limited

Web: www.metiscube.com



Metiscube provide consultancy and expertise in Industry 4.0 technologies to the Northeast of England. At Metiscube we have a deep understanding of digital innovation, e-mobility and business strategy and how they can be applied to your business in order to maximise your growth and profitably. Our commitment is to work alongside business goals and needs and to create and implement successful business strategies. We have collectively over 50 years' experience, working for a wide range of companies from start ups, to SME's, to multinational businesses across a wide range of market sectors, both in the UK and Internationally.

Senergy Innovations

Web: <https://www.senergyinnovations.co.uk/>

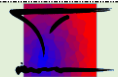


With a background spanning almost 20 years in the commercial roofing industry, **Senergy** are a Belfast based enterprise that design and manufacture SMART Solar Thermal Panels. By combining our roofing expertise with that of global leading engineers, we have developed the Senergy solar thermal panels. Unlike current solar thermal panels that are made from glass, copper and aluminium, Senergy panels are manufactured using advanced nanocomposite plastics.

Being aware of the sun's potential to deliver limitless amounts of solar energy, Senergy was inspired to design an architecturally attractive solution that would reduce the upfront cost of a solar heating system making it affordable to harness the sun's renewable energy.

Nanoscience Centre, University of Cambridge

Web: www.nanoscience.cam.ac.uk



The Nanoscience Centre is an 1800m2 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.



Talga Technologies Ltd, UK

Web: www.talgaresources.com



Talga Resources Ltd (ASX: TLG) is a technology minerals company enabling stronger, lighter and faster products for the coatings, battery, construction and carbon composites markets using graphene and graphite. Talga has significant advantages owing to its in-house graphene product development team, 100% owned unique high grade mineral deposits in Sweden and a pilot process facility in Germany. New products are being developed using Talga's graphene/graphite materials at Talga Technologies Limited UK to suit customers such as industrial conglomerate Tata, BASF subsidiary Chemetall, UK listed Haydale, Zinergy UK Ltd and German based Jena Batteries amongst others.

Advanced Technology Institute - University of Surrey

Web: <https://www.surrey.ac.uk/>
<https://www.surrey.ac.uk/advanced-technology-institute>



The **Advanced Technology Institute** (ATI) is one of **University of Surrey's** world-leading research centres. It brings together researchers with an international outlook in Quantum Information, Nanotechnology, Energy and Advanced Materials.

