AM4BAT Project

Gen. 4b Solid State Li-ion battery by additive manufacturing

Exploitation and Innovation Open Day Workshop

Preliminary Agenda

V1.4

Date: 10 January 2025

Venue: Engineering Front Building,

Executive Suite 103,

Lecture Theatre

UCL

London - UK

(Hybrid)

Time: 09:00 -17:30 (GMT)

Registration: ***link here***

www.am4batproject.eu

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101069756.

Table of Contents

AM4BAT Project

The overall objective of AM4BAT is to develop an anode-free solid-state battery (SSB), fabricated by Vat Photopolymerization 3D printing by LCD reaching energy density of 400 Wh/kg and 1000 Wh/L for Electric vehicles (EV) applications. The assembly and validation of a 3-Ah cell is aimed with a charge capability of 70% of its total capacity in 5 minutes and cyclability of 3.000 cycles reaching 80% of the initial beginning of load. The rapid rise of electric mobility and renewable energies is pushing the market for Li-ion batteries to next levels. By 2030, global battery demand is expected to have grown 19-fold versus 2018 volumes. Commercial Li-ion reaches their limits with gravimetric and volumetric energy densities of 300 Wh/kg and 700 Wh/L.

The AM4BAT consortium composed of 4 SMEs, 3 RTOs, 2 universities and 2 large industries brings the necessary expertise to cover the development of such novel battery, from the synthesis of the materials, their modification, formulation and up-scaling, until the component printing and the cell assembly.

Exploitation and Innovation Open Day Workshop – Venue

The Exploitation and Innovation Open Day Workshop will be hosted by UCL.

Engineering Front Building,

Executive Suite 103,

Lecture Theatre

UCL

Torrington Place,

London, WC1E 7JE

Exploitation and Innovation Open Day Workshop – Preliminary Agenda

Please take notice that all times shown in the agenda are GMT (UK time)

09:00 Arrival and Registration (in person participants)

09:10 Opening of online session

09:15 Welcome to the AM4BAT Exploitation and Innovation Open Day Workshop

Jawwad Darr, University College London, UK

AM4BAT Project Open Day Host

Bojan Boskovic, Cambridge Nanomaterials Technology Ltd (CNT), UK

AM4BAT Open Day Workshop Organiser & Chairman

Bastien Carlos Hualpa De Schuyter, Leitat, Spain

AM4BAT Project Coordinator

09:30 **Julia Aguado Cat & María José Clemente**, Leitat, Spain

Title: Polymeric solid electrolyte for all solid-state Li-ion batteries (AM4BAT project - H2020 GA 101069756)

Solid polymeric electrolyte (SPE) must facilitate efficient ion transport to achieve high conductivity while maintaining sufficient mechanical properties to integrate into battery manufacturing processes. The resin must be compatible with 3D printing, specifically VAT photopolymerization, allowing polymerization under UV light and dissolving lithium salts. To find the best resin formulation, Leitat designed a screening protocol based on the synthesis of films by UV curing of acrylic resins

10:00 **Jawwad A. Darr,** UCL, UK

Title: Combinatorial and Scalable Routes to New Battery Materials

10:30 *Coffee break & Networking*

11:00 **Sam Hasanpoor,** AIT Austrian Institute of Technology GmbH, Austria

Title: Pilot scale Solid-State Batteries; suitable electrolytes for structural batteries

This study aims to develop suitable electrolytes for pilot-scale solid-state structural batteries by leveraging ionic liquids with high ionic conductivity, thermal stability, and mechanical robustness. By addressing the critical demands for structural energy storage—including mechanical integrity and thermal tolerance—this research offers a promising pathway toward scalable, multifunctional energy solutions for advanced technologies, such as aerospace and electric vehicles.

11:30 **Luca Schneider,** LECLANCHE, Germany

Title: Leclanché: a global leader in the large-scale production of water-based binder electrodes for Li-ion cells

Leclanché SA is a world leading provider of high quality energy storage solutions, based on lithium-ion cell technology, accelerating our progress towards a cleaner energy future. It has over 110 years of battery and energy storage innovation, powered by German engineering and Swiss quality. Our solutions are underpinned by world leading in-house technologies. We are vertically integrated and manage the process from electrochemistry to energy management software. We develop our own proprietary lithium cells, battery modules, racks and packs as well as Battery Management Systems and Energy Management Software.

12:00 **Amir Ghaffari ,** Photocentric, UK

Title: Introduction to Photocentric 3D printing solutions and development of 3D printed solid state batteries

12:30 *Discussion*

Moderate by: Dr Bojan Boskovic, Cambridge Nanomaterials Technology Ltd (CNT).

13:00 *Lunch and networking*

14:00 **Ana Bankovic Cassidy,** Cambridge Nanomaterials Technology, UK

Title: Development of Battery Eco-system and Innovation Management Strategy

European competitiveness, strategic autonomy and jobs depend on development of advanced materials in battery manufacturing. Steps towards the creation of the necessary environment needed for successful innovation management strategy, related to battery manufacturing, will be discussed. Strategies related to maximizing impact of exploitation and innovation of the AM4BAT project activities will be presented.

14:30 **Daniel Martí**, Leitat, Spain - *(online)*

Title: Advances in Communication and Dissemination of AM4BAT

The Communication and Dissemination of the AM4BAT will be discussed with the focus on designing and executing strategies that connect with audiences and highlight the impact of the project. Advances and activities related to AM4BAT project will be presented, focusing on increasing the visibility of projects and fostering collaboration among stakeholders, contributing to the advancement of innovation in Europe.

15:00 **Vlad Stolojan,** University of Surrey, UK - *Invited Guest Speaker*

Title: Electrospun nanofibre separators

Advancing energy storage technologies necessitates overcoming inherent challenges in both electric double-layer capacitors (EDLCs) and lithium–sulphur batteries (LSBs). A novel approach using directionally polarized piezoelectric electrospun nanofiber films as separator materials has demonstrated significant performance enhancements in both device types. For EDLCs, tailored polyvinylidene fluoride (PVDF) nanofiber films doped with sodium dodecyl sulfate (SDS) achieved a high proportion of polar β-phases (38 ± 0.5%), introducing a reverse-diode effect that substantially mitigates self-discharge. This polarized separator retained 37% of initial energy after 10 hours, compared to just 4% with nonpolarized commercial alternatives, marking a breakthrough for long-term energy storage solutions.

Similarly, in LSBs, a polar, non-ionic, β-phase PVDF nanofiber separator was designed to address polysulfide shuttling and lithium dendrite growth, two primary barriers to commercialization. This ultrathin (35 μm), lightweight, and highly porous (79.5%) separator exhibited exceptional electrolyte affinity (95%) and ionic conductivity, nearly doubling that of conventional polypropylene separators. Cells using the polar PVDF separator achieved remarkable cycling stability and charge storage capacities of approximately 800 mA h g−1 after 100 cycles at 0.05C, significantly outperforming commercial counterparts by 200 mA h g−1. These findings underscore the transformative potential of engineered nanofiber separators in enhancing the performance and commercial viability of diverse energy storage systems.

15:30 *Coffee break & Networking*

15:50 **Aureli Boisard, SAFRAN, France -** *Invited Guest Speaker (online)*

Title: Introduction to SAFRAN

Safran is an international high-technology group, operating in the aviation (propulsion, equipment and interiors), defense and space markets.

16:10 **Vahid Javan Kouzegaran,** Nanografi Nano Technology, Poland – *Invited Guest Speaker (online)*

Title: Universal Cross-Compatible Air Cathode with Enhanced Conductivity for Next-Generation Rechargeable Energy Storage Systems.

16:40 **Nicky Savjani** - Graphene Engineering Innovation Centre – University of Manchester, UK - *Invited Guest Speaker*

Title: GEIC Supporting UK SMEs in Developing Battery Innovations

To achieve global climate goals and reduce emissions by 2050, new energy storage systems, supported by innovations in energy materials development beyond established lithium-ion battery standards, are essential. Integrating energy storage solutions will be crucial in optimising the growing demand for renewable energy sources in the automotive sector. However, these targets will not be achievable without a significant acceleration in energy materials innovation and industry development.

Despite significant advancements, current-generation energy storage technologies still face limitations in capacity, efficiency, and cost. Overcoming these challenges requires focused research and development to discover new materials and improve existing ones. Emerging technologies such as solid-state batteries and flow batteries show promise in addressing these issues. However, UK SMEs face challenges in delivering proof-of-concept, prototype, and demonstrator energy storage systems due to the high initial capital and operating expenditures required to establish and run a battery lab, often leading to delays in development and, ultimately, innovations being exploited beyond the UK and Europe.

The Graphene Engineering Innovation Centre (GEIC) supports the UK SME battery industry by providing access to an energy lab to develop next-generation battery materials, test them against established benchmarks, and produce small-scale pilot production batches for promotion to the industry. The capability for materials production, characterisation, and utility offers a rapid approach to battery design and development.

17:10 *Discussion*

Moderate by: Dr Bojan Boskovic, Cambridge Nanomaterials Technology Ltd (CNT).

17:30 *End of day*

Note It is planned that all presentations would be followed by Q&A discussion. The organisers reserve the right to change the programme or speakers should circumstances require. For any further enquires please do not hesitate to contact directly the **organisers:** Dr Bojan Boskovic from Cambridge Nanomaterials Technology Ltd on info@CNT-LTD.co.uk

Exploitation and Innovation Open Day Workshop – Speakers

Project Partners Speakers

Dr Bojan Boskovic (*Project Partner & Organiser*)
CEO,
Cambridge Nanomaterials Technology
14 Orchard Way
Lower Cambourne
Cambridge CB23 5BN - UK

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 Charaterisation 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).

Prof. Jawwad A. Darr (Project *Partner & Organiser*)
University College London
UK

Prof Jawwad A. Darr received his Phd in 1995 at Imperial College in synthetic metal-organic chemistry and undertook further postdoctoral research at Nottingham University in supercritical fluids. He worked at the IRC in biomedical materials for two years at Queen Mary University of London (QMUL). From 2001 – 2006, he was holder of an EPSRC Advanced Research fellowship (and lecturer) developing research on “Next Generation Biomedical Materials using Supercritical Fluids”. In May 2007, he joined University College London (UCL), Department of Chemistry. Prof Darr has strong interactions with UK industry related to sustainable routes to the discovery and scale up of new ceramic materials, particularly in energy, optical and healthcare applications. He is the co-founder of UPSIGN, a charity (www.upsign.org.uk) that seeks to support Universities in relation to British Pakistanis in higher education and research.

Bastien HUALPA *(Project Coordinator)*
Leitat
de Innovació 2
08225 - Terrassa
Spain

Bastien HUALPA is senior project manager at LEITAT research centre, based in Spain.

Over 10 years' experience in international affairs, and particularly in European Policies and projects (H2020, HE, DIGITAL, SMP, EuropeAid, etc).

With degrees in European Affairs and PMP® Project Management, Bastien embarked on an eclectic career path that has taken him to work within national government agencies, economic operators, chambers of commerce, and key stakeholders for innovation, as currently in LEITAT.

Julia Aguado Cat *(Project Partner)*
Leitat
de Innovació 2
08225 - Terrassa
Spain

Julia Aguado Cat graduated from a double degree in Chemical and Energy Engineering at the Universitat Politècnica de Catalunya. During that time, she did an internship at CymitQuimica as a chemical data analyst. In 2023 she joined as a researcher in the Energy Storage group (ES) of LEITAT technology center, focusing her activity on the development of solid polymer electrolytes in acrylic base for 3D printing, for integration in generation 4 lithium-ion batteries.

María José Clemente *(Project Partner)*
Leitat
de Innovació 2
08225 - Terrassa
Spain

Maria José Clemente holds a Master' degree in Chemistry and a PhD in Organic Chemistry (2013, UNIZAR). She has experience as researcher in Organic Chemistry with strong focus on Polymer and Material Science, knowledge in synthesis and characterization techniques. She has lead R&D projects and laboratory facilities collaborating in project development with national and international partners. In 2023, she joined the area of Sustainable Advanced Chemistry (SAC) at Leitat where she is involved in polymer electrolyte development.

Sam Hasanpoor (*Project Partner*)
Austrian Institute of Technology (AIT)
Austria

Sam Hasanpoor is a scientist, focusing on solid-state battery scale up.

Dr Luca Schneider (*Project Partner*)
LECLANCHE
Germany

Luca Schneider is a dedicated Project Manager specializing in cell development at Leclanché (Germany). With a strong academic background from the Karlsruhe Institute of Technology (KIT), Luca holds a Ph.D. in Mechanical Engineering. His Ph.D. thesis focused on the electrode structure for Na- and Li-ion batteries.

Amir Ghaffari (*Project Partner*)
Photocentric
UK

Amir Ghaffari is a Lead Battery Scientist with extensive background in materials science and additive manufacturing. He has been working on cathode and hybrid solid electrolyte development and testing for solid state batteries.

Daniel Martí *(Project Partner - online)*
Leitat
C/ De la Innovació 2
08225 - Terrassa
Spain

Daniel Martí is a seasoned professional in communication and dissemination of EU projects. He is passionate about promoting and showcasing the impact of European initiatives. His expertise lies in developing and implementing comprehensive communication strategies that effectively engage target audiences, raise awareness of project goals, and foster collaboration among stakeholders.

Prior to his current role, Daniel Martí gained experience working on the communication field. During this time, he played a pivotal role in organizing and executing communication activities for various companies.

Looking towards the future, Daniel Martí aspires to make an even greater impact on the success of EU projects by amplifying their reach and impact. His goal is to develop innovative communication strategies that leverage the latest technologies and connect with audiences on a deeper level. With his dedication to excellence and unwavering commitment to effective communication, Daniel Martí is poised to make significant contributions to the future of European collaboration and innovation.

Dr Ana Bankovic Cassidy *(Project Partner & Organiser)*
Senior Innovation Manager.
Cambridge Nanomaterials Technology Ltd.
14 Orchard Way, Cambourne
Cambridge CB23 5BN, UK

Dr Ana Bankovic Cassidy is a Senior Innovation Consultant. She joined CNT team in February 2021. Ana graduated from the Faculty of Physics, University of Belgrade Serbia, winning the award for the best BSc (Honors) Thesis of the year 2007. The main aim of her PhD study and further research was

to identify and explain specific kinetic phenomena that occur in positron transport in electric and magnetic field due to non-conservative nature of positronium formation. Ana applied the basic phenomenology of charged particle swarms to study the interaction of positrons with biologically relevant molecules, in order to develop and establish a benchmark for Monte Carlo codes used in positron emission tomography (PET) modelling. Her research activities were undertaken in Centre for Non-Equilibrium Processes at the Institute of Physics in Belgrade, Serbia, a large interdisciplinary group with interests ranging from theoretical, numerical and experimental studies of low temperature plasmas, to studies of positron swarms and their applications, modelling particle detectors and conducting experiments at applying plasma physics methodologies to medicine and biological applications. As a Visiting Researcher at the Open University, Milton Keynes in 2014/15, she worked on quantum chemistry treatment of positron interactions with atoms and molecules using the UKRmol quantum chemistry software.

Invited Guest Speakers

Aureli Boisard *(Invited Guest Speaker - online))*
SAFRAN
France

Aureli Boisard works at Safran Tech, the R&T center of Safran Group, She is leading the Battery Technology Watch activity for the different Business Units of the Group, with a focus on high energy density technologies for propulsive application.

Dr Nicky Savjani *(Invited Guest Speaker)*
Graphene Engineering Innovation Centre
UK

Nic Savjani is the Application Manager for Energy at the Graphene Engineering Innovation Centre (GEIC), at the University of Manchester, The GEIC aims to enable industry partners to facilitate the safe integration of graphene technologies into energy and other sectors. Before GEIC, Nicky conducted extensive research in graphene and 2D materials applications for energy, catalysis, tribology, and semiconductors, accumulating expertise in academic and industrial settings, and within multidisciplinary and multinational programmes.

Dr Vahid Javan Kouzegaran, *(Invited Guest Speaker - online)*
Principal Investigator at Production & Development Department
Nanografi Nano Technology
Turkey

Dr Vahid Javan Kouzegaran received his Ph.D. in Analytical Chemistry with his research project on the application of porous materials (MOFs) as fluorescent biosensing platform for the detection of biomolecules and nucleic acid structures. He started to work as a researcher at Nanografi in the area of the application of porous as well as carbon materials as electrode materials for energy storage purposes, specifically Hybrid Supercapacitors & Metal-air batteries. He is serving as the project manager and main technical person in two Horizon Europe project calls for developing Supercapacitors and Metal-air batteries and is charge of the industrial scale synthesis and production of Graphene Oxide, Reduced Graphene Oxide and a range of Nanostructured materials and dispersions.

Dr Vlad Stolojan (*Invited Guest Speaker)*
University of Surrey
UK

Dr Vlad Stolojan is an Associate Professor in Nanomaterials Characterisation, working in the Advanced Technology Institute as part of the Nano-Electronics Centre and a co-founder of Radical Fibres ltd (now Nanolayr UK), an electrospinning start-up focused on polymer nanofibre R&D for composite, filtration, acoustic insulation and energy storage applications. Dr Stolojan started out as an expert in transmission electron microscopy and spectroscopy, and has built a research portfolio spanning carbon, inorganic and metallic nanomaterials, specific fabrication methods, such as CVD and electrospinning, many characterization techniques (at expert level). Dr Stolojan published extensively in high impact journals (>130 peer-reviewed articles) and invented and co-invented materials,

Exploitation and Innovation Open Day Workshop – Partners

Leitat Technological Center

Web: www.leitat.org

Founded in 1906, **Leita**t is one of the reference entities at state and European level in technology management. It has a team of more than 500 professionals, experts in applied research, technical services and management of technological and innovation initiatives. Leitat provides social, industrial, economic and sustainable value, offering comprehensive solutions in multiple sectors and areas: development of new materials, eco-sustainable production, occupational health prevention systems, revaluation of waste and use of natural resources, interconnectivity and digitization of industry, green energy and maximization of energy efficiency. Leitat is recognized by the Ministry of Economy, Industry and Competitiveness and is one of the main entities participating in the Horizon2020 program of the European Union.

CEA

Web: www.cea.fr/english

The **CEA** is the French Alternative Energies and Atomic Energy Commission ("Commissariat à l'énergie atomique et aux énergies alternatives"). It is a public body established in October 1945 by General de Gaulle. A leader in research, development and innovation, the CEA mission statement has two main objectives: To become the leading technological research organization in Europe and to ensure that the nuclear deterrent remains effective in the future.

The CEA is active in four main areas: low-carbon energies, defense and security, information technologies and health technologies. In each of these fields, the CEA maintains a cross-disciplinary culture of engineers and researchers, building on the synergies between fundamental and technological research.

The civilian programs of the CEA received 49% of their funding from the French government, and 30% from external sources (partner companies and the European Union).

The CEA had a budget of 4,3 billion euros.

The CEA is based in ten research centers in France, each specializing in specific fields. The laboratories are located in the Paris region, the Rhône-Alpes, the Rhône valley, the Provence-Alpes-Côte d'Azur region, Aquitaine, Central France and Burgundy. The CEA benefits from the strong regional identities of these laboratories and the partnerships forged with other research centers, local authorities and universities.

AIT Austrian Institute of Technology GmbH

Web: www.ait.ac.at/en

AIT Austrian Institute of Technology is Austria's largest Research and Technology Organization (RTO), employing about 1,400 people mostly based at the main facilities Vienna Giefinggasse, Seibersdorf, Wiener Neustadt, Ranshofen, and Graz and an international key player in many of the research areas we cover. This makes us a leading development partner for the industry and a top employer within the international scientific community. The company is structured in Centers such as Energy, Health & Bioresources, Digital Safety & Security, Vision, Automation & Control, Low-Emission Transport, Technology Experience, Innovation Systems & Policy.

VRIJE UNIVERSITEIT BRUSSEL (VUB)

Web: http://vub.be/en

VUB is an Urban Engaged University in Brussels, the heart of Europe. 20,000 students, nearly a quarter of them from abroad, are engaged in building their future and that of the world. With top-quality scientific research and customised education, VUB makes an active and engaged contribution to a better and more sustainable society.

The MOBI research group of VUB is the innovative research hub for electromobility in Europe, and aims to make a strong contribution to a more sustainable society. With more than 100 specialists, we form a multidisciplinary team that supports the transition to a more environmentally friendly and electrified mobility and transport system. A unique mix of technical, environmental and socio-economic skills is the strength of our research group. MOBI is the technological expertise center in many areas ranging from electric and autonomous driving, to innovative batteries, intelligent drive systems and energy management, power electronics and charging infrastructure.

TORRECID

Web: www.torrecid.com

TORRECID is a worldwide leading company supplying products, services and technology. TORRECID supplies frits, glazes, ceramic pigments, additives and inkjet inks to ceramic, glass, plastics, paints and textile sectors. Headquarter is located in Alcora (Spain).

LECLANCHÉ

Web: www.leclanche.com

Energy Solution Provider – EU Li-ion cell manufacturer (Willstätt, DE), Electrification of marine vessels and heavy-duty vehicles (e-ferries, e-buses, railway) and integration of renewable energies (stationary applications).

TOSEDA

Web: www.toseda.cz/en

TOSEDA s.r.o. is an SME that was established as a business company in 2010. Two year later the company expanded and changed the main activity to contract research and development and small scale production of specialty polymeric systems. The leading R&D areas are nanotechnologies and environmentally friendly technologies. TOSEDA has recently 7 employees. The R&D Center located in TechnoPark Pardubice occupies area of 130 m2.

The main activity of TOSEDA is design of novel polymeric materials for hi-tech applications and development of environmentally friendly procedures for production of green polymeric materials. The R&D activities and scale-up of the custom designed polymeric systems are supported by analytical and testing laboratories.

Stellantis

Web: www.stellantis.com

Stellantis is a constellation of 14 iconic automotive brands and two mobility arms that are about more than transportation: they're about moving people and making connections.

As we transform into a sustainable mobility tech company, we are guided by the clear vision of our Dare Forward 2030 strategic plan, which paves the way for Stellantis to achieve carbon net zero by 2038(1) and be second to none in value creation for all stakeholders.

We are leading the charge in electrification and software development, with cutting-edge technologies at the heart of our products and services.

Fully committed to our customers and backed by partners that are leaders in their industries, we aim to develop, engineer, manufacture, and scale the best breakthroughs in all facets of sustainable mobility from autonomous, connected, electrified, shared and pre-owned vehicles to micro-mobility, commercial vehicles, and even electric aircraft.

With a community of more than 160 nationalities, industrial operations in more than 30 countries and customers in more than 130 markets, we are among the most diverse companies in the world and able to unite people and ideas across borders and cultures. Our passionate, talented, and diverse teams support our iconic brands in providing freedom of mobility tailored to every need.

Cambridge Nanomaterials Technology Ltd

Web: www.cnt-ltd.co.uk

Cambridge Nanomaterials Technology Ltd (CNT Ltd) is an innovation management and nanotechnology consulting company based in Cambridge, UK.

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 consortiums: Nano-Carbon Enhanced Materials (NCEM) and the Advanced Materials for Additive Manufacturing (AMAM) with members coming from leading multinational companies and research institutions. Through both private consortiums NCEM and AMAM, as well as private and public contracts, CNT Ltd has established

strong relations to the aerospace, automotive, construction, electronics, materials development, biomedical and chemical industry.

In March 2019 CNT Ltd opened a sister company CNT Innovation based in Brussels, Belgium, with the aim to support and complement their work, especially in European related activities.

University College London - UCL

Web: www.ucl.ac.uk

UCL is a diverse global community of world-class academics, students, industry links, external partners, and alumni. Our powerful collective of individuals and institutions work together to explore new possibilities.

Founded in 1826 in the heart of London, UCL is London's leading multidisciplinary university, with more than 16,000 staff and 50,000 students from over 150 different countries.

Photocentric Ltd

Web: https://photocentricgroup.com

Parts on demand producer, award-winning specialist resin and 3D printer manufacturer **Photocentric** is the inventor of LCD-based 3D printing. Based in UK and USA, Photocentric has a vision of enabling custom mass manufacture by making additive parts using disruptive photopolymers and LCD 3D printers, an industrial method of making parts in volume. Photocentric's large format LCD printer range includes Liquid Crystal Magna, which delivers significant speed, large print volume and cost savings to business around the world in a range of industries. Photocentric is a patent holder in visible light curing technologies and specialises in photopolymerisation, manufacturing an innovative range of photopolymer resins compatible with any printer.

Exploitation and Innovation Open Day Workshop– External participating organisations

Graphene Engineering Innovation Centre

Web: www.graphene.manchester.ac.uk/geic/

The **Graphene Engineering Innovation Centre (GEIC)** helps companies develop and launch new technologies, products and processes that exploit the remarkable properties of graphene and other 2D materials.

The GEIC's world-class facilities and resources , located in the Masdar Building, are supported by experienced and knowledgeable applications engineers and internationally renowned academics, working across a broad range of novel technologies and applications. Together, we can help you design, develop, scale and 'de-risk' the next generation of innovative products and processes.

SAFRAN

Web: www.safran-group.com

Safran is an international high-technology group, operating in the aviation (propulsion, equipment and interiors), defense and space markets. Its core purpose is to contribute to a safer, more sustainable world, where air transport is more environmentally friendly, comfortable and accessible. Safran has a global presence, with 79,000 employees and holds, alone or in partnership, world or European leadership positions in its core markets.

Nanografi Nano Technology

Web: www.nanografi.com.tr

Nanografi Co was founded in 2011 as a nanotechnology startup that manufactures and creates a market for critical nanomaterials such as carbon nanotubes (CNTs) and graphene. After successfully producing various types of CNTs, we began to explore the applications of different nanomaterials such as metallic nanoparticles, metal oxides, carbides, and clay nanostructures. As a result of these research and production efforts, we launched a wide range of products to the local market in the second half of 2014. In 2015, the demand in the local market increased, and our company began to develop new applications of nanomaterials according to our customers' needs, from new-generation lightweight materials to high-performance composites for aircraft. At the same time, the miracle material "graphene" and its various derivatives were successfully launched on the market.

University of Surrey

Web: www.surrey.ac.uk/ati/about

The Advanced Technology Institute at the University of Surrey is a multidisciplinary research centre, housing some 160 researchers: engineers, physicists, materials scientists, biologists and chemists. Approximately half of these researchers are PhD students who will drive the next generation of innovation and technology. 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 currently examine issues such as the fabrication of cheap (printed) renewable energy sources, work in making affordable ‘quantum computers’ (single ion implantation), develop novel, high-performance materials for space applications, invent and commercialise new electronic devices (source-gated transistors) and create new materials and metamaterials for optical computing, tissue and cell engineering and retina prosthetics.

Soongsil University

Web: https://eng.ssu.ac.kr/

Soongsil University’s roots trace back to 1897, when Dr. W. M. Baird, an American missionary started teaching from his residence in Pyongyang. Soongsil was then given the title of the first university in Korea. Later during the Japanese occupation when Korea lost its sovereignty, Soongsil University made national liberalization its top priority and took the lead in the national independence movement. In 1938,

the school even decided to close itself down in protest against forced worship at Japanese shrines. Even throughout Korea's tumultuous history, Soongsil has always striven to be the first.

Soongsil University is pursuing global competitive power through specialization. As highly qualified faculty and unique educational programs are customized for each department with alliances between businesses and other universities worldwide, Soongsil is able to meet its goal of producing much needed global talents. It nurtures men and women of faith and ability by building on its long-standing strengths. Thus, it makes giant leaps towards a brighter future.

Ansys Ltd,

Web: www.ansys.com

For more than 50 years, **Ansys** software has enabled innovators across industries to push boundaries with the predictive power of simulation. From sustainable transportation and advanced semiconductors, to satellite systems and life-saving medical devices, the next great leaps in human advancement will be powered by Ansys.

Carrs Weldijng Technologies

Web: https://carrswelding.co.uk/

Carrs Welding Technologies Ltd (CWT) was started in the early 90's carrying out injection mould tool repairs and built up a clientele around the car and food packaging industries.

Through continuous investment in new technology Carrs has grown into one of the market leaders in 'Precision Laser Welding'. From the early days serving the tooling industry, the company has now grown and reaches a customer base of more than 350 companies.

These range from one man engineering companies to international aerospace manufacturers while still supporting the tooling industry.

Providing continuous investment in staff and equipment over the last 33 years has enabled Carrs to provide tailored welding solutions for each enquiry. Whilst also performing a 'While U Wait' tooling repair services. Alongside the everyday demands of ongoing production orders.

Carrs achieved the ISO 9001 quality standard in 2001 and is now accredited to the latest version ISO 9001:2015. Allowing us to continue to serve all our customers to the level they have come to expect from Carrs.

Sunlight Group

Web: www.sunlight-group.com

Sunlight Group Energy Storage Systems is a leading technology firm with extensive experience in energy storage solutions, specializing in lead-acid and lithium-ion batteries, chargers, and IoT solutions. With state-of-the-art facilities across four continents, they cater to over 115 countries. Their expertise extends to enabling the transition to a carbon-free future through products and services supporting grid stability and renewable energy integration. They excel in motive power batteries for intralogistics and leisure mobility, while recycling is a core aspect of their operations, with a cutting-edge Recycling Plant certified by the EU Eco-Management and Audit Scheme (EMAS). Committed to sustainable development, they align with ESG targets and Sustainable Development Goals (SDGs), reflected in their annual Sustainability Report and EcoVadis bronze sustainability rating. They uphold the Ten

Principles of the United Nations Global Compact, emphasizing sustainability, innovation, and ethical leadership, alongside fostering inclusive workplaces and supporting local communities.

The Catalan Institute of Nanoscience and Nanotechnology – ICN2

Web: https://icn2.cat/en/

The **Institut Català de Nanociència i Nanotecnologia,** with its official English translation Catalan Institute of Nanoscience and Nanotechnology and acronym ICN2, is a non-profit international research institute located close to Barcelona (Catalonia, Spain). It is devoted to generating knowledge, materials and devices in ICT, health, energy and the environment.

The ICN2's expertise lies at the nanoscale, where new properties, interactions, and ways to exploit them in everyday life are being discovered. Among its goals is to bring together scientists from diverse backgrounds in the pursuit of better science, better training, and better outreach to society while also seeking out new ways to engage with local and global industry.