

Management Group Newsletter—August 2017

This issue of our Newsletter contains short articles on:

- **An overview of the UK Catapults together with a profile of the CPI Formulation**
- **An introduction to the developments in Manchester relating to Graphene**
- **Lecture and webinar programme for the remainder of 2017**
- **Committee member profiles, Eddie and William**

As usual, we hope you find this Newsletter interesting and welcome any feedback that you might have which can be sent to wweaver@hotmail.co.uk. Please note however that this is the last time that this Newsletter will be sent out by post. Future copies will be available only via the RSC website and MyRSC.

Best Wishes

The Management Group Committee

1. UK Catapults

In 2010 the leading technology entrepreneur Hermann Hauser recommended in a report for the UK Government the creation of a network of technology and innovation centres around the UK to deliver a step change in the UK's ability to commercialise its research. This was followed by a further report in 2014 outlining the scope, shape and ambition of the Catapult network. Today there are 11 Catapult Centres (<https://catapult.org.uk>):

- Cell and Gene Therapy
- Compound Semiconductor Applications
- Digital
- Future cities
- High value Manufacturing (a network of another seven centres)
- Medicines discovery
- Offshore renewable energy
- Precision medicine
- Satellite Applications
- Transport Systems

The catapults are not-for profit centres connecting the best of UK's business and scientific communities to collaboratively solve key problem, develop new products and services on a commercial scale. To date the Catapults have delivered 2473 industry collaborations and in doing so supported 2851 SME's. Below the CPI's National Formulation Centre (part of the High Value Manufacturing Network) is profiled.

Enabling Innovation in Formulation (CPI National Formulation Centre)

Complex formulated products are abundant in both every day and industrial life, underpinning many sectors of the UK economy. Examples include perfumes, medicines, cosmetics, washing powder, processed foods, paints, adhesives, lubricants, composite materials and pesticides. However, in a world in which

ingredients derived from natural sources are increasingly in demand, and companies are looking to conserve time and resources, there is a need for the development of techniques and models that will enable predictive design of formulated products, helping companies save time and money in the development process. The Centre for Process Innovation (CPI), the UK's technology innovation provider for process manufacturing and part of the High Value Manufacturing Catapult, provides the assets and resources to support the improvement and creation of innovative formulations that apply to a range of new and improved manufactured products. CPI is developing capability that will enable formulators to learn thoroughly and quickly at small scale, before scaling up for commercialisation.

CPI enables companies to analyse, refine and optimise formulations across a broad range of market sectors. Working with companies of all sizes, from SMEs and academic institutions to large corporates, CPI takes an industry-led approach bringing together cutting-edge, cross sector expertise and technology and infrastructure. This approach provides an environment for innovation that increases productivity and accelerates the commercialisation of next-generation formulated products, whilst significantly reducing risk and cost. Partnering with CPI enables companies to build consortia and deliver projects that will create sustainable open access capability to help cross-sector UK formulation industries overcome innovation barriers.

CPI's formulation facilities are flexible, allowing the company to support the design of processes for a range of formulated products, including powders, liquids, solids, and polymer systems. CPI builds on its industrially relevant expertise in process development to enable transition through the value chain from ingredient to formulated product, from bench to pilot scale. It is through its extensive characterisation and analytical capability, and industry trained operators and scientists, that CPI enables companies to fully understand the nature of their product and process. CPI can help companies to explore product applications with associated mechanical and performance testing, ensuring consistent product quality is delivered across scales and from batch to batch. Essentially, using CPI's formulation facilities and expertise, partners can reduce and de-risk capital investment, connect to innovative solutions, gain avoid resource conflicts within own business, and gain access to the latest developments in analytical technology.

CPI is working on numerous projects with a diverse range of companies. An example of one of CPI's latest project advancements is the Chariot Project. Led by market leading global industry partner Procter & Gamble, the consortium includes leading academics from universities of Leeds, Birmingham, Cranfield and Durham, innovative UK based SMEs IIT and Ajax, and CPI. The Chariot project has developed powder-processing technologies to benefit a broad range of powder producing industries. For example, the project has demonstrated that the acoustic sensing technology can be used as a low cost way to monitor powder flow rates in an industrial setting. The compact nature of the sensor allows it to be easily attached to existing equipment, whilst providing robust data. Particle-wall interaction in the vicinities of the sensor

produces clear burst in the measured signal, however the sensor will not pick up interference from acoustic events happening around the processing equipment. CPI's National Formulation Centre at NETpark, is currently co-located within CPI's Printable Electronics and Graphene Centres. However, CPI is in the progress of building a new national innovation centre, based at NETpark, County Durham, that will provide open access facilities and expertise for companies to develop, prove and scale-up their newly formulated products. Due for completion later this year, this facility will create an environment for innovation that will allow companies to be more efficient in their use of resources, and to accelerate the commercialisation of next-generation formulated products.

Helen Briggs - Communications Manager, CPI

2. Continuing Graphene Developments at University of Manchester (Building a Graphene City)

Due for completion in 2018, the £60m Graphene Engineering Innovation Centre (GEIC) will be an international research and technology facility.

The University's second world-class centre will see industry-led development in graphene applications in partnership with academics. The facility will be critical in the development of commercial applications and in maintaining the UK's continued growth in graphene and related 2D materials.

Together, the NGI and GEIC will provide an unrivalled critical mass of graphene expertise. The two facilities will reinforce Manchester's position as a globally leading knowledge-base in graphene research and commercialisation.

Linking into existing national expertise, the GEIC will focus on pilot production and characterisation, together with application development in composites, energy, solution formulations and coatings, electronics, and membranes.

Graphene City – Manchester

- Currently over 260 graphene researchers.
- £61m National Graphene Institute (NGI).
- £60m Graphene Engineering Innovation Institute (GEIC).
- GrapheneNowNano Centre for Doctoral Training.
- Henry Royce Institute for Advanced Materials due to open in 2019.

Current NGI Collaboration with Industry

The NGI focus is on academic led research (TRL 1-5) into graphene and related 2-D materials in collaboration with industry.

- Demonstrations of:
 - New concepts/new applications/fundamental studies.
 - Graphene potential by producing new concept products and processes.

Collaboration is key at the National Graphene Institute. Over 60 world-leading companies are already partnered with The University of Manchester working on graphene applications. These collaborations offer our industrial partners the opportunity to work alongside our world-leading academics and over 260 researchers working on graphene and related 2D materials.

GEIC Commercialisation Model

The GEIC will operate at TRL levels ranging from 3 – 6, focussing on developing innovative products and industrial processes and addressing issues involved with scale-up.

The opening of the GEIC will offer industry access to specialist equipment, facilities and know-how to rapidly develop, test and optimise new products, processes and technologies. This will reduce risk and time to acquire skills and knowledge thus accelerating the time to market.

James Baker – Graphene Business Director

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3. Management Group Lecture and Webinar Programme 2017

Date	Title
Thursday 14 September	Industry 4.0 and Chemicals Manufacturing – Design twice, make once <i>Gareth Jenkins, CEO, Britest Limited</i>
Monday 25 September	Face-to-face Networking: turning networking into opportunity for advancement <i>Sarah McCloughry, STEMM Commercial</i> (Webinar)
Tuesday 24 October	To be confirmed (Webinar)
Thursday 16 or 23 November	To be confirmed

All lectures in the Fish Room at Royal Society of Chemistry, Burlington House, London – 6 pm for a 6.30 pm start.

All webinars start at 12.30 pm and will finish at 1.30 pm

Register at <http://rsc.li/2kd8yGo>

4. Marketing Group Programme 2017

Date	Title
Monday 16 January	Treatments of surfaces for coatings <i>John Paul Griffiths, Oxford Advanced Surfaces</i>
Thursday 9 March (AGM)	The fascination of fragrances <i>Brian Ridley</i>
Monday 8 May	Steel industry innovations and future prospects <i>Gareth Stace, Director, UK Steel</i>
Monday 3 July	Visit Hunterian Museum, Royal College of Surgeons
September	The rise and fall of probiotics

Thursday 12 October	The significance of chemistry in the water industry <i>Prof Steve Kaye, Head of Anglian Water Services and Centre for Environmental Policy at Imperial College London.</i>
November	Visit RR Communications Recycling centre near Heathrow
December	The Internet of Things applied to chemistry &/or agriculture ??

5. Committee Member Profiles

Eddie S Norton CChem, MRSC

Eddie started industrial life as a laboratory assistant at the J Lyons & Co Ltd laboratories in Hammersmith where he gained experience in the analysis of a wide range of foodstuffs including milk, cream, ice cream, meat products, jam and marmalade. It may be of interest to know that the "jam" content of Lyons Swiss rolls was made from potatoes, the carbohydrate content of which had been converted to sugar by an enzymatic process. The unattractive appearance of the product being made acceptable by the use of appropriate dyes.

This was followed by a short period at Donald MacPherson & Co as an assistant chemist analyzing the pigments and polymers used in paints. Eddie then moved on to the British Oxygen Co Ltd Research laboratories at Morden where he worked for the following 9 years working on cyanamide, dicyandiamide and melamine, followed by cyclo-octa-tetrazene and its polycyclic derivatives.

In 1955 Eddie had the opportunity to join the Atomic weapons Research Establishment at Aldermaston leading to an association with explosives for forty years and positions at the Royal Ordnance factories in Chorley, Bridgwater and Bishopton. Eddie's final role was with the Chief Inspector of Naval Ordnance in Bath eventually retiring in 1987. Eddie was however soon re-enlisted to serve by the Ordnance Board to serve on a NATO project first in Columbia, Maryland, USA and then finally at NATO Headquarters in Brussels. Eddie finally retired in 1996 since which time he has been a member of the RSC Management group serving on the committee as a member and Secretary.

William Weaver BSc, MSc, CChem, MRSC, MIOD

After completing a degree in chemistry at the University of Lancaster in 1978 William joined the Donald MacPherson group working on the Barking site in East London developing a range of powder coating systems for both industrial and decorative applications. In 1987 after completing an MSc he moved to Ciba Geigy in Duxford, joining the Structural Adhesives Group where he gained broad experience in the formulation of Aerospace adhesives developing several products for the new Airbus aircraft. Subsequently he went on to work in the composites group developing toughened matrices for a range of applications.

In 1994 William moved north to Newcastle upon Tyne joining Resinous Chemicals soon to become a member of Akzo Nobel where he managed the R&D team

developing both composites and coatings. In 2001 while continuing to live in Newcastle William took up the role of European R&D Manager for the Akzo Nobel Resins group and stated what was to become a 15 year commute across the North Sea each week.

Following the acquisition of the Akzo Nobel resin group by Nuplex (an Australian chemical multinational) William was appointed as Vice President of Technology overseeing R&D activities in Australia, New Zealand, China, Vietnam, Malaysia, Indonesia, USA, the Netherlands, Germany and the UK.

Following the acquisition of the Nuplex Group by Allnex to form the world's largest industrial resin entity in 2016 William left the company and after a short break joined Applied Graphene Materials on the Wilton site as Technical Director, where he is responsible for the development of applications for graphene containing coatings, composites and functional fluids.