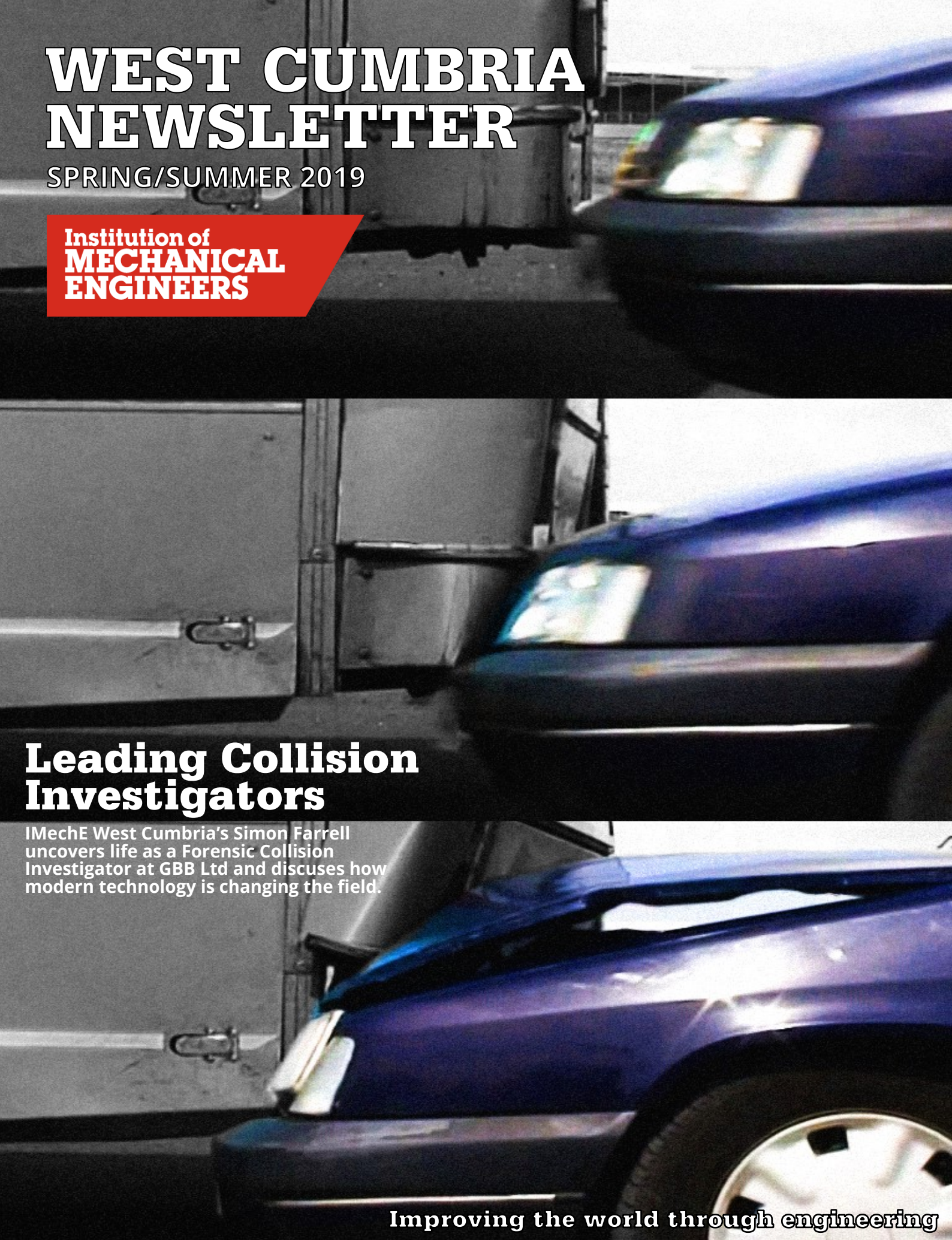
WEST CUMBRIA NEWSLETTER

SPRING/SUMMER 2019

Institution of MECHANICAL ENGINEERS



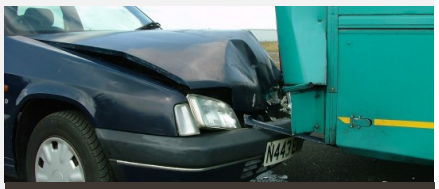
Leading Collision Investigators

IMechE West Cumbria's Simon Farrell uncovers life as a Forensic Collision Investigator at GBB Ltd and discuses how modern technology is changing the field.

Improving the world through engineering

NEWSLETTER

SPRING SUMMER 2019



Follow Us!

Our new year's resolution is to increase IMechE West Cumbria's social media. So like, share and tweet us to keep up with your Institution on Facebook and Twitter

IMechE West Cumbria

@IMechE_WCumbria

GET INVOLVED

CONNECT WITH OTHER MEMBERS, SUPPORT THE INSTITUTION AND SHAPE THE ENGINEERING FUTURE.

Institution of MECHANICAL ENGINEERS

CHAIR COMMENT

Welcome to the Institution of Mechanical Engineers West Cumbria Area Spring/ Summer Newsletter. May I first wish you all a Happy New Year, and hope you all had a wonderful Christmas.

I am delighted to introduce our first IMechE West Cumbria Newsletter for 2019. Inside you will find information on the Engineering Learned Society activities that we have undertaken over the past six months. Events have included lectures on Vehicle Collision Investigation, Industrial Heavy Lifting and Advanced Manufacturing Nano Technology. Numbers attending our lectures and visits remain at a good level, however we hope to increase our attraction this year by an increased use of social media to advertise our talks and visits. So please make sure you 'like' and 'follow us' on our social media platforms, shown on the left.

STEM

This year, we are hoping to increase our STEM (Science, Technology, Engineering, and Mathematics) Educational Engagements activities. To that effect, we have appointed a new STEM Co-ordinator - Ned Furniss. Ned will be looking at what the Institution has done historically, what's available now and what is wanted across the West Cumbria Schools communities to develop a fit-for-purpose revitalised STEM Educational Programme for our area.

Spring/Summer Events

On the back page you will find a poster depicting this season's events programme. We have a number of fantastic opportunities for you to engage with your IMechE, including a visit to PaR Systems Limited, who are an International Remote Handling specialist that have established their European Headquarters here in Cumbria. We also have visits to Bendall's Engineering in Carlisle, who specialise in steel fabrication and also a visit to TIS Engineering's facility in Workington who also specialise in fabrication, welding and non-destructive testing. We are also holding a lecture on the new Workington Transport Hub with Story Contracting Ltd and a talk on the CDM Temporary Works Legislation and its impact. Please book your place onto our events, as well as sharing our itinerary with your friends and colleagues - Get Involved!

We want you!

We are also looking for new Committee Members to help keep us fresh and motivated. The role of the Area and YMP Committees is to facilitate the delivery the Institution's Vision, Mission and Strategic Objectives at a local level by; 'Inspiring the Next Generation' through fit-for-purpose STEM Engagement activities, facilitate the Continued Professional Development (CPD) of the local membership by delivering relevant and appropriate events, and promoting engineering in West Cumbria through our Events Programme and our formal (work) and informal (social) networks. To that end, all members of the Area Committee are actively involved in activities on behalf of the Institution that can be aligned to these values. We are always looking for new people to join the committee to keep us fresh and innovative, and by doing so it will seriously enhance your Professional Registration progression, be that to IEng or CEng, or if already registered, then to Fellowship. If you want to get involved, please get in touch via our IMechE West Cumbria Near you website below.

Annual Dinner 2019

Work has now started on planning our 15th IMechE West Cumbria Annual Dinner. We are currently finalising this year's theme and our VIP Guests/Keynote Speakers - so please keep an eye on our area website for details of this and all our other activities. I would like to take this opportunity to once again thank all our sponsors for supporting our annual dinner; without their fantastic support we would not have the funding to continue to grow our Educational Initiatives, and also to the generosity through donations of those who attended the dinner to help our 2018 chosen charities; Cockermouth Mountain Rescue, Hospice at Home and the Great North Air Ambulance.

With best wishes,

Caroline Hamilton CEng MIMechE
Honorary Chair – IMechE West Cumbria Area

Keep up with your local IMechE

Visit the IMechE West Cumbria Area website to keep up-to-date with the latest events, talks and visits here in you local region. You can get in touch with IMechE West Cumbria via the website, or by emailing us at: **WCumbSec@imechenetwork.org** - you can also request to sign up to our IMechE West Cumbria mailing list.

Become a member of the IMechE

As an apprentice, student or experienced engineer, we have a membership type appropriate to your career stage. For those pursuing professional registration, we offer Engineering Technician, Incorporated Engineer and Chartered Engineer. Find out about membership or professional registration for you or your colleagues at **www.imeche.org/membership-registration/become-a-member**

If you're an existing member of the IMechE with a vision to be a future volunteer in education, find out about becoming a STEM Ambassador at **www.imeche.org/get-involved/volunteering-opportunities/volunteering-opportunity-details/stem-ambassador**

IMechE UK

Keep up with the latest engineering initiatives and developments from around the UK and globally on the main IMechE website, visit **www.imeche.org**

SPECIALISED HEAVY LIFTING

AS THE GLOBAL MARKET LEADER IN ENGINEERED HEAVY LIFTING, MAMMOET HELP CLIENTS IMPROVE THEIR CONSTRUCTION EFFICIENCY AND OPTIMIZE THE UPTIME OF THEIR PLANTS. THE COMPANY'S UK COMMERCIAL MANAGER, ALEX SCOTT, TALKS TO IMECHE WEST CUMBRIA..

On 18th September 2018, Commercial Manager of Mammoet's UK (Nuclear Projects) Alex Scott, provided a thought-provoking presentation into the introduction to Heavy Lift Engineering. The talk was held at Lakes College West Cumbria and covered Mammoet's industrial breadth and depth, as well as the diverse industries they work within - from refineries, power plants, mining and metals, offshore, infrastructure, civil constructions to shipbuilding.

For over two-hundred years, Mammoet has been focused on civil engineering, power generation, petrochemical and mining industries and offshore projects. The logistic challenges in these industries are growing daily. Factors such as remote locations, harsh climates and a strong emphasis on the environment are constantly driving the company towards smarter and safer solutions.

Alex's talk went into detail about the main types of lifting devices available to the market and gave examples of the main lifting systems being presently used on Mammoet projects, this included; conventional heavy lift cranes up to 5000 tons, skidding system, four point lifting systems and cartridge jack up systems to strand jack gantries. With the company's wide range of experience, Alex's talk also uncovered when lifting is not the right option.

In support of Mammoet's credentials for undertaking significant Heavy Lift projects, Alex's presentation went into high level detail about projects at Flammanville (Nuclear NEW Build), Sellafield Pond 2B Sub frame (FGMSP), Clifton Boulevard Bridge replacement (Highways Civil Structural), Chernobyl Dome installation (Nuclear Containment), Dubai Eye (Dubai's version of the London Eye) Yamal LNG refinery project (located in deepest Siberia) and a brief explanation about the salvaging of the stricken Russian Nuclear Submarine Kursk. When questioned, Alex advised that Mammoet was developing a commercial partnership project on lifting activities in Japan's Fukushima, but was not able to disclose details as yet. Something for a future talk perhaps?

Mammoet prides itself in helping clients improve construction efficiency and optimize the uptime of plants and installations. For that purpose, they provide solutions for lifting, transporting, installing and decommissioning large and heavy structures. Delivering the most efficient solution for its clients, the company states that their business is all about time - uptime, turnaround time and time to market. To their customers, time is the currency that matters most, which is why the company strives to bring their customers deadlines forward. It's an integrated, daily effort shared by everyone at Mammoet, in every aspect of their services - creative engineering, careful planning and safe delivery. This is how Mammoet moves time for its customers.

Time isn't set in concrete, or forged in steel and not even all that heavy - yet, it's the biggest thing can be moved to help the customer. Time is so important to Mammoet that the company's mission statement is 'The Biggest Thing We Move Is Time'. Mammoet's commitment to time is proven in every project the company is involved with, and clearly in Mammoet's eyes the more challenging the better.

Alex detailed one of Mammoet's more challenging projects, the Yamal LNG refinery, which is a vast Liquified Natural Gas plant, which required year-round construction in Siberia. A modular prefabricated approach was undertaken where 142 modules weighing up to 7,000 tons were assembled off-site ready for transport and installation to Siberia. This minimised the impact of the weather on construction and optimized the reliability of the supply chain. This remote and perilously cold location sits on the largest gas reserves in the world.

The Yamal plant has three liquefaction trains with each carrying 5.5 million metric tons of LNG per year. The plant is one of the biggest and most complex energy projects ever undertaken. Its safe and efficient construction required equipment and expertise on an unprecedented scale for Mammoet, and all to be deployed to an area subject to the most challenging of conditions.

Alex completed his presentation with an open question and answer session, allowing guests to further delve into the dynamics of Mammoet. The talk provided a detailed insight into the world of heavy lifting and the logistics of Mammoet, with IMechE wishing to thank Alex for his presentation.

Adrian Norendal, IMechE West Cumbria

IMechE West Cumbria's Adrian Norendal thanks Alex for his presentation, and another delighted recipient of an IMechE West Cumbria 'Pit Tankie'.

Optimising Resources for Rapid Progression

A Malaysian state oil firm set an ambitious target for the construction of their proposed refining and petrochemical complex. To ensure the tight deadline was met, Mammoet were given responsibility for around 80% of the heavy lift assignments. The company brought three of the world's largest cranes on-site – the first time this had ever been done. With such a capacity to upscale and mobilise rapidly, Mammoet were able to schedule people and resources to maximize efficiency across the entire operation. Despite the presence of a severe electrical storm, the project was completed safely and on-schedule.

VEHICLE COLLISION INVESTIGATION: REVISITED

FROM MINOR MARKS TO CONFIRM FRAUDULENT CLAIMS TO TYRE MARKS INDICATING PRE-IMPACT SPEEDS, SIMON FARRELL DISCUSSES HIS WORK AS A FORENSIC COLLISION INVESTIGATOR, AND UPDATES US ON HOW MODERN TECHNOLOGY IS CHANGING THIS FIELD.

Following a presentation to local IMechE members and public guests in September 2014, Simon Farrell, Honorary Treasurer of IMechE West Cumbria Area Committee, returned on 9th October 2018 to give an update on developments in the field of Forensic Collision Investigator work that he has been engaged in with his employer GBB (UK) Ltd.

This FARO Focus 3D laser scanner allows for the documentation of crime scenes, through an augmented reality model and this means that jurors can be better informed of evidence and more information may be presented during a trial.

GBB is a market leading team of forensic scientists, engineers and collision investigators who can offer impartial and expert advice on motoring and engineering matters. GBB differentiates itself from other consultancies with its own self-funded research department and has been acknowledged in Court for its 'research-based and reasoned approach'.

The presentation was a co-hosted event between IMechE West Cumbria and the Materials Society of Cumbria and explained the range of work that is undertaken by GBB (UK) Ltd. The work generally involves gathering evidence by examining damaged vehicles or visiting the scenes of collisions, preparing evidence or assessing evidence gathered by others and preparing advice for clients or reports for the Court. The presentation concentrated on the three main areas of work; low speed impacts, fraud and large loss.

Low Speed Impacts is an area that covers injuries in minor collisions such as 'whiplash'. As an engineer, Simon stated that his expertise is obviously not that of a doctor so he is clearly unable to provide comments on whether or not an person involved in a collision is or was injured. However, by considering the damage to the vehicles, the structures of the vehicles and the nature of the collision, he explained how GBB are able to determine the nature of the accelerations the vehicles experienced. Using data gathered from GBB's own crash testing, together with other available data, it is possible to comment on how an acceleration of a particular magnitude compares to other activities. From this the client or the Court can determine the likelihood of someone being injured.

In recent times, insurance companies have had increased claims for personal injury from different types of collisions, not just 'rear end shunts', and GBB (UK) Ltd have researched a wider range of collisions in order to understand their efficiency at transferring momentum and what movement can occur within the vehicles. Examples of this research and cases in which it was used were outlined and discussed during the talk. Simon gave examples of how other evidence, such as CCTV footage can be used to corroborate what has been determined from the vehicle damage. Simon went on to highlight a case in which he designed and ran bespoke tests of two pieces of plant machinery which were involved in a low speed collision on a work site, which resulted in a significant claim for personal injury. These tests ultimately lead to the claim being determined as being fraudulent.

Fraud in motor insurance claims can come in many different forms. Engineering expertise is generally used to review the damage to vehicles and determine whether it is consistent with having been caused in a collision between those particular vehicles and whether the collision has occurred as described by those involved in the collision. Simon discussed a case that involved a side impact, where a vehicle was said to have pulled out from a side road and collided with a vehicle travelling along the main road. He showed, using GBB's own crash testing, what damage would have been expected and explained how the actual damage to the vehicles confirmed that the vehicle reported to be moving on the main road was in fact stationary.


3D scan and reconstuction

Simon went on to outline a further example of a case in which he was given minimal evidence of the damage sustained, but how it could still be used to show that the damage was not consistent with the reported scenario. In that particular case, the evidence was used in a trial that led to the conviction of 44 people in a 'crash for cash scam'.

The presentation then turned to the subject of 'Large Loss' which Simon explained refers to cases in which there could potentially be large financial losses for an insurance company. These generally involve fatalities or injuries. GBB (UK) Ltd clients usually want to know whether a particular driver is at fault for the collision and investigations revolve around the speeds of the vehicles, lines of sight/avoidability or vehicle defects. Simon gave a number of examples showing how different techniques and programs can be used to determine how a collision has occurred. These included looking at the distance a pedestrian is thrown in a collision by a vehicle, length of skid marks and the distance a vehicle is shunted by an impact

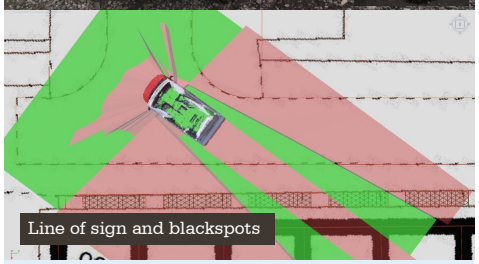
The attendees were then shown examples of the condition of vehicles that have been involved in a high speed/high energy collision and how it can be difficult to confirm whether the failure of a component is a result of the incident or the cause of the incident. Examples were given of how techniques such as laser scanning can be used to investigate and record large loss incidents. These included how scanning of both a collision locus and the vehicles can be used to recreate the circumstances of the collision, and how scanning a vehicle can be used to provide details of a driver's field of vision and a vehicle's blind spots.

One area of investigation that is an emerging field of work is investigation of data that is stored within a vehicle's CPU (central processing unit). Since Simon's previous presentation, GBB has invested in equipment that can interrogate a vehicle's CPU in order to recover data that may pertain to an incident that it has been involved in. This can assist in investigating how damage has progressed through the vehicle during a high energy collision or whether the reported circumstances, such as the time and speed of a collision, match the data that is recorded by the vehicle - including whether a Bluetooth device such as a phone was in use at the time of the collision, engine temperature, revs, etc.

Simon closed his presentation by saying that he hoped he had shown how GBB (UK) Ltd is the only private and independent company in this line of work to have a fulltime research department and how that research assists him greatly with his investigation work.

Simon Farrell, IMechE West Cumbria


Component failure


Line of sign and blackspots

COLLISION INVESTIGATION IS SPLIT INTO TWO WORK STREAMS

CLAIMS VALIDATION
- Damage Consistency and Causation
- Occupant Movement

LARGE OR CATASTROPHIC LOSS
- Desktop Analysis
- Vehicle Examination
- Scene Visit
- Helmet Examination
- Reconstruction

DRAWN TO PERFECTION

DERWENT HAS BEEN MAKING PENCILS IN CUMBRIA SINCE 1832, COMBINING TRADITIONAL PENCIL MAKING SKILLS WITH STATE-OF-THE-ART MANUFACTURING TECHNIQUES. IMECHE WEST CUMBRIA VISIT THE FACTORY, DISCOVERING THE ART OF PENCIL MANUFACTURE.

On Thursday 15th November 2018, IMechE West Cumbria members and guests visited Derwent Pencil factory. The company has specialised in making pencils for over 175 years, and offers a comprehensive range of pencils and art related products, all of which are today manufactured at their facility at Lillyhall.

Derwent relocated to a new modern multi-million pound factory in Lillyhall back in 2008.

The history of Derwent Pencils dates back to reports that during a severe storm in Borrowdale back in the beginning of the 1500s, trees were uprooted revealing a strange black material. This material was graphite, which the local shepherds started using to mark their sheep. A little later in the history of the company, this material was found useful in the military industry and other uses were explored as years went by.

As a result of this development in the graphite industry, Great Britain's first pencil factory opened in 1832, Banks, Son & Co. In 1916, the factory was renamed The Cumberland Pencil Company.

A notable point in the company's history was that in 1930, for the first time ever, a range of pencils specifically designed for children was introduced. It was followed in 1938 by a brand of pencil named 'Derwent' which was specifically designed for artists. The name 'Derwent' was derived from the Derwentwater lake close to its then manufacturing base in Keswick. The company developed to become the supplier of a huge assortment of art materials from its tradition roots to evolving into what it is today, with ability to constantly innovate and be at the cutting edge of design and production.

To meet its growth and aspirations, in 2008 a new purpose-built factory was built in Lillyhall, Workington. It was opened by Her Majesty The Queen, accompanied by His Royal Highness The Duke of Edinburgh, and pencil production was relocated to the new facility. Visiting the new factory provided a great opportunity to visit a company with a long heritage in Cumbria. Throughout its long illustrious history, the product range has changed beyond recognition, but Derwent Pencils commitment to excellence has remained unchanged.

The Derwent Pencil Museum still stands on the site of the original factory in Keswick. Visitors enter the museum through a replica graphite mine which would have served as the source of the pencil industry's principal raw material over three centuries ago, before commencing their fascinating journey of graphite and pencil development from its humble beginnings as a cottage industry to modern day production - including discovering secret WW2 pencils with hidden maps; one of the largest colour pencils in the world measuring almost 8 metres; The Queen's diamond Jubilee pencil; miniature pencil sculptures; and much more!

Our IMechE visit was hosted by Angus Smeaton, Manufacturing Engineer and supported by Lynn Scott, Research and Development Chemist, who both provided a very informative presentation covering the history of pencil making and the importance of continued research and development to allow Derwent to continue to stay ahead of the competition.

Following the presentation, a tour of the facilities at Derwent took place, where the party were guided through the pencil manufacturing process, with Angus and Lynn taking various questions along the way. The tour outlined the differences between the Keswick and Lillyhall facilities, and the advances in technology between the old and new factories, including new rainwater harvesting, biomass heating and intelligent ecolighting.

The tour included a visit to the mixing area, which contained numerous mixing machines used for mixing colours, which after adding water and heating to a controlled temperature, were formed into a paste. The mixture of hand and automated processes, and the knowledge and skill of the operators shone through as they explained to their audience in detail the finer points of pencil making. At various stages throughout the production, process quality control checks were carried out where colour and textures were checked against laboratory standards.

The wood used in the pencil manufacturing process is cedar wood, which has grooves machined in it to allow the graphite core to fit in. The pencil graphite or coloured core is laid into the groove in the lower half before the upper half is fitted, and both halves are then glued together before being cut into individual pencil lengths. This was a fascinating part of the process to see and smell with lovely fragrances of the wood being machined. A series of finishing process were applied to the pencils during the final stages including painting and waxing.

The tour included a visit to the well-stocked stores and busy packing area where orders were packed and dispatched to customers. There was an extensive range of products on show which are sent all over the world to repeat and new customers.

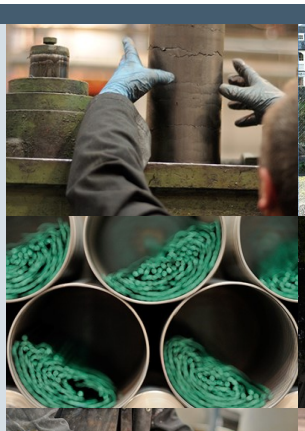
The visit concluded back in the boardroom where further questions were answered and thanks given in the form of our customary "Pit Tankie" to Angus and Lynn for their and Derwent Pencils' fantastic hospitality.

John Crook, IMechE West Cumbria


IMechE West Cumbria's John Crook thanks Angus and Lynn for the presentation and tour,

COMPANY TIMELINE

- **1500** Graphite found in Borrowdale
- **1565** First record of a wood cased Borrowdale Graphite pencil by Konrad Gessner
- **1600** Graphite in lump form used as lubricant, medicine & for armaments
- **1832** First recorded factory manufacturing pencils in Keswick
- **1939** 72 Derwent colours developed
- **1941** Secret wartime pencil produced for aircrew in bomber command, WW2
- **1981** Pencil Museum opens in Keswick
- **1982** 'The Snowman' released – Derwent pencils were used to create the animation
- **1998** UV painting process developed
- **2001** Manufactured the world's longest coloured pencil (7.91 metres)
- **2002** Won Queen's Award for Enterprise for UV process
  'Ice Age' released – Derwent pencils were used to create characters
- **2008** New factory built at Lillyhall, opened by Her Majesty The Queen



THE CHALLENGES OF ADVANCED MANUFACTURING

A PIONEERING DISCUSSION INTO THE DEVELOPMENT OF ADVANCED MANUFACTURING AND ITS FUTURE CHALLENGES HERE IN THE NORTH WEST, WITH AN INSIGHT INTO SURFACE ENGINEERING, ADDITIVE MANUFACTURING, MICRO-MACHINING, NANO-MANUFACTURING.

On the 6th December 2018, IMechE West Cumbria were delighted to welcome Professor Lin Li from the University of Manchester. As a recipient of the Arthur Charles Main Award from the Institute of Mechanical Engineers, the Wolfson Research Merit from the Royal Society and the Sir Frank Whittle Medal from the Royal Academy of Engineering, Professor Li's visit came at a time when interest in developing new manufacturing techniques and the recruitment of skilled staff has never been greater.

Professor Lin Li is director of the Laser Processing Research Centre at the University of Manchester and discussed his exclusive insight into the development of the sector. With over 380 publications in peer reviewed journals and 60 patents related to laser processing and photonic science, Professor Li provided attendees with a fascinating insight into Nano-manufacturing techniques from his breadth of industry knowledge.

Highlights included the development of nanofabrication technologies in support of the required precision and resolution for manufacturing optimisation, as well as insight into some of the challenges faced while working at the Micro/Nano scale.

Professor Li covered the work that he has done on the development and control of material surface functionalities by laser generation of 2D and 3D periodic structures, and their interactions with surrounding media. These included the control of wettability of materials, such as super-hydrophobic and super-hydrophilic surfaces. Professor Li spoke keenly how utilising simple methods, different topographies were fabricated on copper surfaces. The topography of these resulting microstructures can be controlled by simply changing the scanning speed of the laser beam.

After surface chemical modification, it was verified how these as-prepared surfaces displayed traits of superhydrophobicity combined with different adhesion to water. Surfaces with deep microstructures displayed self-cleaning properties with extremely low water adhesion, with the water adhesion increasing when the surface microstructures became flat. With samples, Professor Li showed the audience how superhydrophobic surfaces with different adhesion can be used for transferring small water droplets without any loss. The relationship between the contact angle, scanning speed and sliding angle is shown below.

Professor Li demonstrated how the optical properties of surfaces could be controlled, this included light absorption, scattering, emission and colours. Surface modification at Micro and Nano scales, which have successfully transformed highly reflective materials to either completely absorb or reflect certain colour of light, result in the creation of black and coloured metals. The applications of this technology include solar energy absorbers, radiative heater transfer devices, infrared sensing and airborne and spaceborne devices of various types of radiation.

Professor Li was careful to demonstrate throughout the lecture an overview of material properties which can be achieved from nanomaterials, including improvements in strength, elasticity and resilience to numerous environmental conditions such as extreme temperatures and corrosion.

Further improvements which have resulted from nanomanufacturing include the control of aerodynamic properties of the surface, control of stiction forces, and friction coefficients, control of surface properties for bonding and adhesion, control of bio-compatibility, and control of bacterial adhesion and dust adhesion of the surfaces. Nanosecond, picosecond and femtosecond lasers were used in support of this research.

Applications of these special surface structures included data storage. Professor Li demonstrated how the development of phase-change-materials and advancements in precision-engineering-techniques have led to the realisation of high density data storage to meet an ever-increasing demand, while simultaneously decreasing costs.

Extending the concept of further advancements, Professor Li outlined the concept to produce these devices by introducing the 3D structures from a technique known as two-photon polymerisation. This was first demonstrated in 2001, with the production of micro-bulls of 10 µm long and 7 µm high.

Professor Li also noted the application of laser technology in medical applications, such as vascular cleaning. The process involves the production of Nano Particles (NPs) in pure water that are free of any chemical contaminants. Composite NPs can be rapidly generated by simultaneous ablation of bulk metal blocks in the same reaction using a laser beam.

The physical properties of the resulting NPs could also be controlled by applying various laser processing parameters. The resulting materials were subsequently rigorously tested and displayed a significant reduction in rates of bacteria absorption against current materials and methods. Materials displayed low toxicity to the human cells originated from the lung, kidney, liver, skin and blood vessel cells, in addition to low toxicity to the human cells originated from the lung, kidney, liver, skin and blood vessel cells, TiO2 demonstrated stability and was, as in the case of data storage components, of low cost.

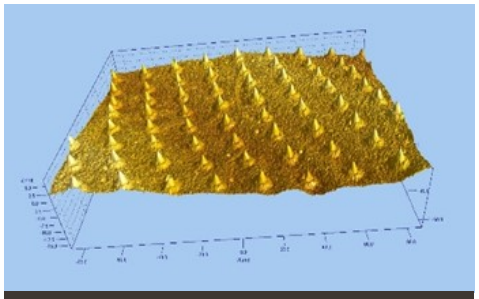
Sensor development was mentioned as another important application of laser Nano-manufacturing technologies. Recent developments include the manufacture of carbon nanotubes in the manufacture of a Nitrogen Dioxide gas sensor, which demonstrated high sensitivity and rapid response when exposed to the gas.

The audience were highly appreciative of Professor Li's engagement with a range of questions posed at the end of the talk. The topics covered are described in more detail in publications which are available from Professor Li's website at the University of Manchester: www.research.manchester.ac.uk/portal/lin.li.html

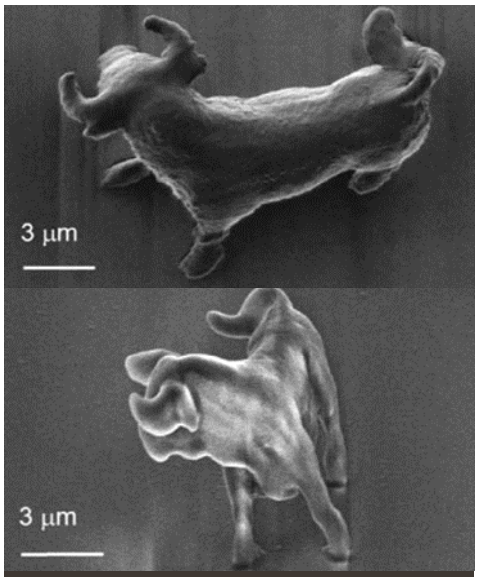
Professor Li subsequently mentioned his portfolio of research into the Nuclear sector, particularly in relation to his Arthur Charles Main Award from the Institute in 2001 for his work in laser based nuclear decommissioning technology, and as such we have planned second lecture in the near future focusing on his Nuclear experiences. IMechE West Cumbria extend out thanks to Professor Li for his time and presentation, it was a great honour for him to be part of our Winter season events.

Mike Farrer, IMechE West Cumbria

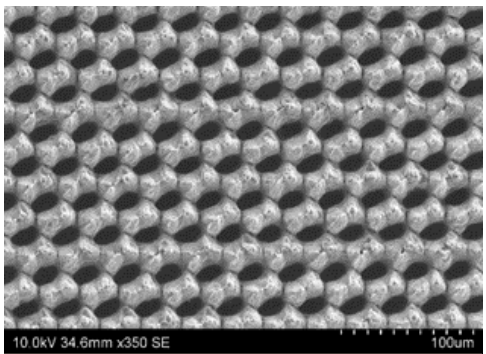
Professor Lin Li on the day of receiving the Sir Frank Whittle Medal from the Royal Academy of Engineering in 2013.



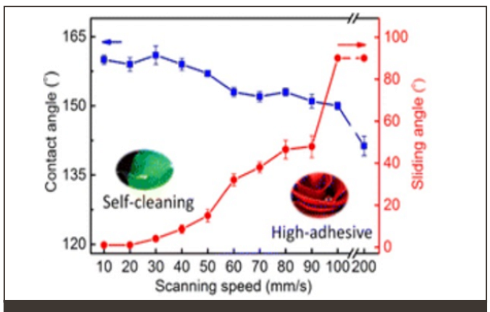
Laser fabricated Nano bumps produced on nickel–phosphorus coated aluminium (NiP/Al).



'Micro-bulls' with fine 3D features, microstructures fabricated with multiphoton polymerization.



Laser fabricated 3D periodic micro-structures on Si.



Inter-relationship of Laser Contact Angle, Scanning Speed and Sliding Angle in the fabrication of superhydrophobic surfaces with tuneable water adhesion.

Institution of MECHANICAL ENGINEERS

EVENTS CALENDAR

TECHNICAL VISIT

PaR Systems - Engineering Intelligent Solutions

13 February 2019, 19:00 (registration from 18:30)

An opportunity to visit the European Head Quarters for the International Remote Handling Company, PaR Systems at Lillyhall, Workington. PaR Systems is regarded as the intelligent solutions provider for driving quality, productivity, and safety in manufacturing and other demanding environments since 1961, providing material handling, automation, and robotic solutions to many diverse industries and specialized markets.

Location: PaR Systems, Lillyhall, Workington
Organiser: David Williamson (djw7@sellafieldsites.com)

TALK AND PRESENTATION

CDM – Temporary Works

05 March 2019, 19:00 (registration from 18:30)

Steve Ingle, Nuclear Access Compliance Manager Responsible for the Development of Temporary Works Policy, Procedure and Training within Altrad Industrial Services will provide an insight into why the Temporary Works British Standard was introduced, the types of temporary works and how the standard affects the scaffolding industry with regards to design and build.

Location: Lakes College West Cumbria, Lillyhall, Workington
Organiser: Adrian Norendal (Adrian.Norendal@altrad.com)

TALK AND PRESENTATION

Story Construction - Workington Transport Hub

25 April 2019, 19:00 (registration from 18:30)

Workington Transport Hub is one of a number of transport interchanges constructed in West Cumbria to promote better use of public transport. This talk will discuss the innovative solutions adopted and how construction work was orchestrated, with the aim to encourage sustainable travel along the Cumbrian Coast and improve access to both Workington Railway Station and the Cumbrian Coast railway line.

Location: Lakes College West Cumbria, Lillyhall, Workington
Organiser: Caroline Hamilton (caroline.hamilton@iggesund.com)

TECHNICAL VISIT

Bendalls Engineering - Experts in Design & Fabrication

15 May 2019, 13:00 - 15:00

An opportunity to visit Bendalls who have a track record of manufacturing mission-critical equipment that sit in the heart of global multi-million pound processing facilities. Starting in Cumbria in 1894 specialising in steel fabrication, Bendalls has been at the forefront of fabrication technology, notably manufacturing the body panels for Donald Cambell's Bluebird land and water record-breaking speed machines.

Location: Brunthill Rd, Kingstown Industrial Estate, Carlisle, CA3 0EH
Organiser: James McNally (james.mcnally@llwrsite.com)

TECHNICAL VISIT

TIS Cumbria Ltd - Fabrication, Welding & NDT Specialist

18 June 2019, 13:00 - 15:00

A visit around the TIS Engineering facility. TIS Cumbria Limited (TIS) is one of West Cumbria's leading fabrication, welding and NDT specialist capable of taking concepts from design, through to production, installation and inspection. They have a home-grown workforce with a reputation for quality, efficiency and reliability.

Location: TIS Cumbria Ltd, 5A Derwent Dr, Workington CA14 3YW
Organiser: Tom Pritt (Tom.Pritt@jacobs.com)

ANNUAL DINNER

IMechE West Cumbria Annual Dinner 2019

27 June 2019, 19:30 (pre-drinks reception from 18:30)

The 15th IMechE Annual Dinner will be themed around Engineering Sustainability, and in support of that we are delighted to have Baroness Julia Brown of Cambridge DBE FREng FRS, member of the House of Lords and advocate for Science, Technology, Engineering and Environment as our VIP Guest.

Location: Lakes College West Cumbria, Lillyhall, Workington
Organiser: Caroline Hamilton (caroline.hamilton@iggesund.com)

ATTENDANCE TO OUR EVENTS MUST BE BOOKED THROUGH OUR WEBSITE

For more details and to book your place visit: **nearyou.imeche.org/near-you/UK/North-Western/West-Cumbria-Area/events**

Pre-booking your place on an event is mandatory. Events will become active for bookings nearer its date. Events are for all ages with no specific requirements unless specified. You do not need to be a member of the IMechE to attend, all are open to the public and free entry unless stated. Visit the events page of our website for more information or contact the event organiser.

BEP PROJECT TEAM

ARUP

Lakes College West Cumbria

IGGESUND HOLMEN GROUP

NWP North West Projects Advanced Engineering Design

JACOBS

ATKINS Member of the SNC-Lavalin Group

wood.