

Events Newsletter

Mersey and Western Cheshire Network including the Isle of Man

September 2019 – January 2020

**Future Engineers in the Making:
School Liaison in Action**

All our events are
FREE to attend for
IET members and
non-members alike,
pages 10–11



Do you want to receive your personal hard copy of January 2020 Newsletter?
See requesting opting-in, page 3

The 2020 Annual Dinner

Friday 7th February 2020 at

The Hilton Hotel, Liverpool

£60 for individual tickets for Members, Non-Members and Guests
£40 for student members

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Local Network Chair's Message



Welcome to the September 2019 edition of our Newsletter. The Newsletter contains articles on some of the many events held since January 2019 and the programme of events planned and organised by the Local Network's all-important Volunteer Groups for the period September 2019 to end of January 2020. I thank all the Local Network Volunteers who have made their valuable contributions over the period.

The Local Network has run 25 events including lectures, seminars, workshops, technical visits and our Annual Dinner on the 7th February in the period January to July 2019 with good attendances throughout. We are very appreciative of the support we get from organisations in our region that have hosted Technical Visits including with others, Atlas Copco, Bilfinger UK, Cammell Laird, Stadler Rail, STFC Daresbury and University of Liverpool.

In April our Young Professionals Group ran a very successful round of the IET's international competition

"Present Around the World". It was International Women in Engineering day on Sunday 23rd June 2019 and to mark this day, on Monday 24th June, the Young Professionals Group had an excellent event with two keynote speakers and a presentation competition. This was a most enjoyable event. See page 5 for more information on these events.

Our School's Liaison Team have continued to support schools and colleges in our area attending many events including the Big Bang Fair North West 2019. The Newsletter front cover is a photograph of the team from Queen's Park High School, Chester, who were Runners-up at the Birmingham Big Bang Fair in March with their biscuit dunking machine. The Local Network encourages students at our local universities and colleges with Local Network Student Excellence Awards.

We held our IET Annual Dinner on Friday 1st February 2019 with over two hundred guests at the Hilton Hotel in Liverpool. The charity raffle held at the dinner raised over £1,100 which was equally shared between the IET Benevolent Fund, IET Connect and Macmillan Cancer Support. We have started planning the 2020 Dinner which will be on Friday 7th February 2020 and we hope to see you there.

The key resource the Local Network has is the efforts of our Volunteers. The events and activities cannot take place without essential volunteer contribution. If you are able to contribute some volunteer time to the Local Network, please contact me.

Rob McDonald
IET MWC Network Chair
robert.mcdonald@ietvolunteer.org

Individual Copies of the January 2020 Newsletter – Opting in

Opting – in to posting of individual copies of the Mersey and Western Cheshire Local Network Events Newsletter.

If you would like to request that you receive an individual hard copy of the January 2020 Events Newsletter in the post, please email me, Rob McDonald, using my IET

Volunteer email address robert.mcdonald@ietvolunteer.org before Friday 13th December 2019.

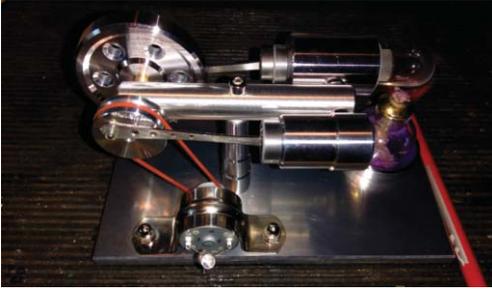
Rob McDonald
IET MWC Network Chair
robert.mcdonald@ietvolunteer.org

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Successful SLO Activity

As usual the SLO team have been very busy with events at Primary Schools, Secondary Schools and Colleges running Career Events and giving talks on the benefits of STEM and Engineering. We have also started to improve our range of demo equipment with the purchase of a new Wimshurst Machine - the other one is now worn out - and a quite amazing Stirling Engine.



The Queen's Park High school 'Biscuit Dunkers' not only came runners-up at the Birmingham Big Bang in March, but they have now won the Class/Team of the year award for Year 10 in the Cheshire Schools Awards. So congratulations to them and the secret is now out that the best biscuit for dunking is a custard cream.

The SLO team hosted a Careers Event for Cadishead Primary School on the 10th of June held on board the steam powered vessel DANIEL ADAMSON, which the pupils enjoyed enormously. In addition to its pleasure cruising role



it is used as a STEM learning platform sailing along the River Weaver.

This year again saw the STEM Big Bang Event held at the Liverpool Waterfront Exhibition Centre. We spent the Monday setting up the IET stand and on the Tuesday four of our members ran the stand.

Some five thousand pupils from all over the North-west attended, meeting exhibitors and education providers alike.

The IET were again present, having a stand manned by Local Network members, keeping them fully employed running and explaining the workings of the latest demonstrator models, making LED torches and talking to students about careers in engineering.

Roger was chosen by All About STEM as this years Head Judge at the event where schools competed against each other on a chosen project. We wouldn't envy his job as all teams displayed innovative solutions.



Some ten schools were awarded prizes and recognition.

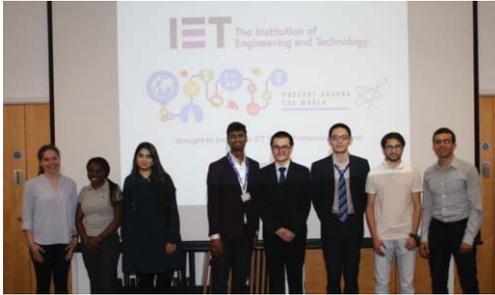
At the end of July our IET Local Network prizes were presented to students from Chester and Hope Universities.

If you feel you can support the SLO Team our contact details are on the back page of this Newsletter.

Roger Todd & Alan Dixon

Present Around the World Competition

The Young Professional Group successfully organised the Present Around the World (PATW) competition. All events were extensively advertised to ensure a wider community is being informed and those interested are aware of activities. In particular PATW competition was extremely successful. PATW (which is for both members and non-members of the IET) is a global competition for Young Professionals and Students within engineering to develop and showcase



presentation skills using an engineering topic for their choice. These presentations often reflect current and future technologies and because the competitors are showcasing their presentation skills, the presentations are always very interesting.

The competitors delivered a ten minute presentation on their chosen engineering or technology-related area, with three minutes for questions. This year there were 10 volunteers to present and our panel of four judges were:

- Dr. Chim Ya Hua, postdoctoral research associate in biomedical engineering.
- Mr. Robert McDonald, Chair of IET Mersey & Western Cheshire Network.
- Dr. Ian Belger, Chief Electrical Engineer, Sellafeld Ltd.
- Mr. John Gronow, Head of Fleet Contracts, Merseyrail.

It was very interesting to hear about the exciting presentations done by young professionals. Following the announcement from the judging panel, the winner with the highest score was Mr. Rahul Kothari with his presentation about Augmented Reality and the runner-up presenter was Ms. Cara Hawkins who spoke about Quantum Physics.

Ashkan Eliasy

Competition for Women in Engineering

The Young Professional Group for the first time decided to celebrate International Women in Engineering Day.



This event provided a chance to network with successful North-west engineers to strengthen and support younger women interested in science, technology, engineering and mathematics to pursue a career in engineering. Attendees had the opportunity to listen to two very interesting female role models: Angela Seeney - Executive Director for Transformation at Sellafeld Ltd, and Prof. Rachel Williams, Professor of Ophthalmic Bioengineering at University of Liverpool. Both have experienced a successful career in engineering. They shared their successes, struggles and the stories of how they overcame their struggles throughout their careers. The event also included presentations from aspiring young engineers on their work in employment or studies. They were attempting to impress our judging panel including our two guest speakers and Paula Quinn -



Learning and Development Manager at Nuvia. Following five fantastic presentations the judges settled on awarding Carley Jackson and Aimee MacFayden with our 1st and 2nd place prizes.



Ashkan Eliasy

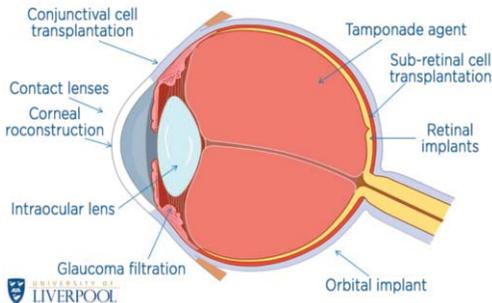
Ophthalmic Bioengineering

In the Competition for Women in Engineering, Professor Rachel Williams gave a presentation on Ophthalmic Bioengineering.



She started by showing how light entered and passed through the eye to the retina at the back of the eye and thus how any injury or disease that interrupted that lightpath could cause loss of vision. She then explained how biomaterials have been used to address many of these issues, from contact lenses to retinal implants. She picked out four specific topics where her research has concentrated.

Role biomaterials in overcoming vision loss



In relation to the front of the eye she presented her research on the development of a novel peptide hydrogel contact lens. She demonstrated how the mechanical properties of the gel could be tailored to the required level and how the chemistry of the material meant that the lens was antimicrobial and as such could have a role in reducing corneal infection due to contact lens wear. Secondly, she discussed how the same material was being optimised for use in a corneal tissue engineering application to replace the use of corneal donor tissue.

In relation to the back of the eye Professor Williams explained how age-related macular degeneration is one of the commonest causes for vision loss in the older population in the developed world and how it is associated with damage to a layer of cells called the Retinal Pigment Epithelium under the retina. She discussed how her group had developed a strategy to replace these damaged cells with healthy ones grown in the laboratory on a very thin membrane out of Gore-Tex and how this had to be modified with a gas plasma to ensure the cells would attach and grow. Finally, she discussed her research on the development of new silicone oils for replacement of the vitreous in the treatment of retinal detachments. She explained the importance of the interfacial energetics, specific gravity and viscosity of the oils in terms of good clinical outcomes. She described how she was involved in a project that increased the extensional viscosity of the oils to reduce the emulsification in the eye and that this was now a commercial product in use to treat patients around the world.

Overall, the research she presented demonstrated how critical the material properties are in developing the right material for the specific application. She discussed how her career had brought her to this point and allowed her to bring together all the skills she needed to do her research and in particular, she emphasised how important it was to her career to develop meaningful collaborations with people in other disciplines including clinicians and industrialists.

Professor Rachel Williams

IET Mersey and Western Cheshire Network

Annual Dinner 2019

The IET Mersey and Western Cheshire Network Annual Dinner took place on 1st February 2019 at the Liverpool Hilton Hotel with over 200 guests. This lively event was supported by Bilfinger UK and the "Friends of the Network", including academia, industry and businesses. Mr Robert McDonald, Local Network Chair in his opening address greeted the dinner guests and highlighted some points in the life of the Network. This year the Guest Speaker was Mr Mike Houghton, Managing Director - Process Industries and Drives, Siemens, who delivered the Keynote Address.

The 2020 Annual Dinner will be held on 7th February 2020.





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Technical Visit to Cammell Laird Ship Builders and Repairers

On 24th April, David Williams, Business Development Director of Cammell Laird hosted an IET Local Network visit to Cammell Laird's shipyard on the banks of the River Mersey at Birkenhead. The visit covered the history of Cammell Laird reaching back to the mid-19th century, Cammell Laird's technology and engineering competencies of today and its extensive engineering and ship building facilities. We learnt about Cammell Laird's training schemes for young people and their community engagement programmes.

Presentations were given on the latest block construction techniques used by Cammell Laird. This included how the Royal Research Ship Sir David Attenborough is being constructed by the shipyard.



This magnificent ship is the first major complex commercial vessel built in the UK in over 30 years. It is a

demonstration of the competence of the management, staff and contractors who are taking part in its design and construction.



On the site tour, we saw the enormous, modular construction hall, the dry docks and wet basin. In the dry docks, we saw vessels undergoing major conversions and upgrades. The organisation of the day, the presentations given, and the tour of the shipyard were first class. This was a most memorable technical visit.

The IET Mersey and Western Cheshire Network highly appreciates the long standing support of Cammell Laird.

Rob McDonald

Technical Visit to Atlas Copco, Deeside

On the 10th July 2019 Atlas Copco UK at Deeside hosted an IET technical visit to their facility that specialises in the manufacturing of rivets and riveting systems. IET Member Kevin Williams, Service Training Co-ordinator at Atlas Copco, organised what was an excellent technical visit on behalf of the Manufacturing and Management Group.



It was very impressive to see on one site, research and development facilities, application systems design and

manufacture along with the rivet manufacturing plant which produces billions of precision rivets for industry each year. The Atlas Copco Innovation Centre has the technology to demonstrate what can be achieved by Atlas Copco's industrial bonding and jointing solutions.



The Atlas Copco staff we met were first class and a credit to both the Company and the engineering and manufacturing community.

Rob McDonald

Leadership Seminar 2019

In June 2019 the IET LN Manufacturing and Management Group teamed up with Hopkins & Ball for the 2019 IET Leadership Seminar.

Over 70 delegates from some of the leading organisations in the North-west, enjoyed hearing from three leaders from Howorth Air Technology Ltd, Perpetual Partnerships and Custerian.

Firstly, Jim Liptrot, Managing Director, talked through how Howorth Air Technology in Farnworth, Bolton had transformed their employee engagement over the last few years. He focused on Purpose, People and Behaviours (the Howorth Way) and how that had also led to a transformation in their success in helping save lives in medical and pharmaceutical applications.

Then, Simon Norie, Co-Founder of Custerian talked through how they help organisations deliver on their core purpose of 'Work Made Better'.

Finally, Garry Rogerson, Managing Director of Perpetual Partnerships, reflected how good leadership qualities, a focus on recruitment and the building of relationships leads to an engaged organisation.



The speakers then took insightful questions from the delegates before retiring for a buffet.

Many thanks to our host Daresbury Laboratory for supporting the event and we are looking forward to the 2020 Leadership Seminar.

Jerry Hopkins

Mersey and Western Cheshire Network

Visit to Stadler's Kirkdale Depot, Liverpool

On the early evening of 26th June, IET Members, John Gronow, Head of Fleet Contracts, Merseyrail and David Brennen Engineering Director Stadler Rail Service UK Ltd hosted an IET Local Network technical visit to Stadler's Kirkdale, Liverpool Depot.



The Kirkdale Depot is undergoing an extensive upgrade and rebuilding project, ready for the arrival of the new fleet of 52 Stadler Rail built, Class 777 electric multiple-unit, metro trains. The new trains will start to come into service in 2020. The new trains will be owned by the Liverpool City Region Combined Authority, operated by Merseyrail and cleaned and maintained by Stadler Rail.

John and David gave an excellent talk on the new train fleet that will come into service and the new facilities under

construction by BAM Nuttall for Stadler Rail before taking the attendees for a site tour of the newly constructed facilities.



We toured the facilities which at the time of the visit in June were largely complete. The facilities include a maintenance shed, a modified wheel lathe building, washing and train stabling facilities and office space. These are state of the art facilities purpose-built to meet the needs of the new train fleet. Kirkdale will be the main maintenance facility for the new trains.

This was an excellent visit and the careful organisation of the visit by John and David to ensure safety on what is an active depot was much appreciated.

Rob McDonald

DATE	EVENT AND LOCATION	PRESENTER
Thursday, 12th September	5G Mobile Phone Networks Inglewood Manor Hotel, Ledsham, South Wirral, CH66 8PF	Professor Nigel Linge, University of Salford
Tuesday, 1st October	The Deepwater Horizon Oil Well Blowout YMCA Wirral, 56 Whetstone Lane, Birkenhead CH41 2TJ	Simon Brown, Retired Principal Inspector/ Offshore Operations Manager
Thursday, 10th October	The Manchester Ship Canal Inglewood Manor Hotel, Ledsham, South Wirral, CH66 8PF	Les Green supported by Chris Ellams
Thursday, 31st October	Robotics - Fail Safe Design of Autonomous Systems? YMCA Wirral, 56 Whetstone Lane, Birkenhead CH41 2TJ	Professor Michael Fisher, Liverpool University
Wednesday, 6th November	Technical Visit to Glen Dimplex: Advances in Medical Appliances- Smart Technologies Glen Dimplex, Stoney Lane Whiston Prescot Merseyside L35 2XW	Phil Harris, Manufacturing Director
Monday, 11th November	Cyber Security Conference Molloy Auditorium, University of Chester, Parkgate Road, CH1 4BJ	Multiple - TBC
Tuesday, 12th November	Latest Developments in Energy from Waste STFC Daresbury Laboratory, Cheshire, WA4 4AD	Tom Woods, Senior Electrical Engineer SUEZ Recycling and Recovery
Thursday, 14th November	A History of Bromborough Port Inglewood Manor Hotel, Ledsham, South Wirral, CH66 8PF	Gavin Hunter
Tuesday, 3rd December	The Developing World of IoT Applications and Emerging Communications Technologies YMCA Wirral, 56 Whetstone Lane, Birkenhead CH41 2TJ	Mike Stirling, Technical Director Taylor Dowding Innovation Limited
Wednesday, 11th December	Technical Visit to CNC Robotics Ltd - Automation Insight CNC Robotics Ltd, 3B Olympic Way, Aintree, L30 1RD	Michael Gilbert, Development Engineer CNC Robotics Ltd, Philippa Glover, Managing Director CNC Robotics Ltd, Peter Storey, Autodesk Manufacturing Applications Engineer
Monday, 13th January 2020	Professional Registration Evening 6th Floor Conference Room, Electrical Engineering and Electronics Building, University of Liverpool, 9 Brownlow Hill, Liverpool L69 3GJ	Lou Parfrey LN Manager for the North of England and Professional Advisors

All our events are free to attend for

For more information on how the IET supports CPD

If you do not have access to the internet, registration

Contact details are shown on



SECTOR	GROUP	TIME	CONTACT	CPD
Information and Communications	Retired Professionals Group	Start 2:00 p.m. Refreshments and Networking 3:30 p.m. Finish 4:00 p.m.	Keith Done Registration not required	2
Information and Communication / Energy	Electronics & e-Systems	Start 6:30 p.m. Refreshments and Networking 6:00 p.m. Finish 8:30 p.m.	Brian Clark Registration not essential but requested by email or telephone	2
Information and Communications	Retired Professionals Group	Start 2:00 p.m. Refreshments and Networking 3:30 p.m. Finish 4:00 p.m.	Keith Done Registration not required	2
Design and Production / Information and Communications	Electronics & e-Systems	Start 6:30 p.m. Refreshments and Networking 6:00 p.m. Finish 8:30 p.m.	Brian Clark Registration not essential but requested by email or telephone	2
Design and Production	Manufacturing and Management	Start 5:30 p.m. Refreshments and Networking 5:00 p.m. Finish 8:00 p.m.	Michael Gilbert Online registration required	2
Information and Communications	Young Professionals	Start 5:30 p.m. Refreshments and Networking 5:00 p.m. Finish 8:00 p.m.	Alex Edwards Online registration: https://chesterhackers.co.uk/events/pop-ax-conference-2019/	2
Energy	Power Group	Start 7:00 p.m. Refreshments and Networking 6:30 p.m. Finish 8:30 p.m.	Bob Green Registration by email	2
Information and Communications	Retired Professionals Group	Start 2:00 p.m. Refreshments and Networking 3:30 p.m. Finish 4:00 p.m.	Keith Done Registration not required	2
Information and Communication	Electronics & e-Systems	Start 6:30 p.m. Refreshments and Networking 6:00 p.m. Finish 8:30 p.m.	Gordon Nicholas Registration not essential but requested by email or telephone	2
Design and Production	Manufacturing and Management	Start 5:30 p.m. Refreshments and Networking 5:00 p.m. Finish 8:00 p.m.	Michael Gilbert, Ben Walker Online registration required	2
All Sector	Young Professionals	Start 5:00 p.m. Refreshments and Networking 4:30 p.m. Finish 8:00 p.m.	Lou Parfrey Online registration required	1

NET members and non-members alike

please visit <http://www.theiet.org/membership/career.cpd>

can be done via e-mail or telephone to the contact listed

event synopses on pages 12-14

September 2019

5G Mobile Phone Networks

Date: *Thursday, 12th September*

Time: *Start 2:00 p.m.*

Refreshments and Networking 3:30 p.m.

Finish 4:00 p.m.

Venue: Inglewood Manor Hotel, Ledsham,
South Wirral, CH66 8PF

Speakers: *Professor Nigel Linge, University of Salford*

This year sees the launch in the UK of the next generation of mobile network and phone, the so-called 5G. Our journey to this point began in the 1980s when the first generation of analogue mobile phones was introduced. The move to 2G in the 1990s heralded improved communications and the introduction of data services. Third generation subsequently brought better Internet connections and then 4G offered high-speed broadband connectivity. The talk will explore why 5G is needed, how it differs from 4G, which new applications and services will become available and the potential impact it will have on our lives.

Registration not required / CPD 2 hrs

Contact: *Keith Done, keithdone@gmail.com*

01948 820080 / 07774 192591

October 2019

The Deepwater Horizon Oil Well Blowout

Date: *Tuesday, 1st October*

Time: *Start 6:30 p.m.*

Refreshments and Networking 6:00 p.m.

Finish 8:30 p.m.

Venue: YMCA Wirral, 56 Whetstone Lane,
Birkenhead CH41 2TJ

Speakers: *Simon Brown, Retired Principal Inspector /
Offshore Operations Manager*

On April 20th 2010, BP's Macondo oil well, being constructed by the Deepwater Horizon oil rig in the Gulf of Mexico, blew out resulting in 11 fatalities, the sinking of the rig, the largest accidental oil spill in history and financial losses for BP in excess of \$20 billion. Initial investigations revealed faults in the 312 ton subsea blowout preventer and its control systems. However subsequent analysis focussed on the management of BP and its contractors. The presenter advised the UK government on the implications of the incident for oil well drilling practices on the UK Continental Shelf.

Registration not essential but requested by email or telephone / CPD 2 hrs

Contact: *Brian Clark, bjclarkobe@btinternet.com*

01704 227650 / 07443 538954

The Manchester Ship Canal

Date: *Thursday, 10th October*

Time: *Start 2:00 p.m.*

Refreshments and Networking 3:30 p.m.

Finish 4:00 p.m.

Venue: Inglewood Manor Hotel, Ledsham,
South Wirral, CH66 8PF

Speakers: *Les Green supported by Chris Ellams*

The Canal is a 36-mile (58 km) long inland waterway linking Manchester to the Irish Sea. It follows the original routes of the Rivers Mersey and Irwell through the counties of Cheshire and Lancashire. Several locks lift vessels about 60 feet (18 m) up to Manchester, where the canal's terminus was built. Major landmarks along its route include the Barton Swing Aqueduct, the only swing aqueduct in the world, and Trafford Park, the world's first planned industrial estate and still the largest in Europe. Les and Chris will talk to us about the relationship the Daniel Adamson Preservation Society has with the Canal.

Registration not required / CPD 2 hrs

Contact: *Keith Done, keithdone@gmail.com*

01948 820080 / 07774 192591

Robotics – Fail Safe Design of Autonomous Systems?

Date: *Thursday, 31st October*

Time: *Start 6:30 p.m.*

Refreshments and Networking 6:00 p.m.

Finish 8:30 p.m.

Venue: YMCA Wirral, 56 Whetstone Lane,
Birkenhead, CH41 2TJ

Speakers: *Professor Michael Fisher, Liverpool University*

Truly autonomous systems, such as (future) robots or vehicles, will make their own decisions about what to do without necessarily consulting humans. How can we trust such systems if we do not know what, and crucially why, these systems will make their decisions? In this talk, Michael will describe how the use of agents at the core of these systems can form the basis for trustworthiness.

Registration not essential but requested by email or telephone / CPD 2 hrs

Contact: *Brian Clark, bjclarkobe@btinternet.com*

01704 227650 / 07443 538954

November 2019

Technical Visit to Glen Dimplex:

Advances in Medical Appliances – Smart Technologies

Date: *Wednesday, 6th November*

Time: *Start 5:30 p.m.*

Refreshments and Networking 5:00 p.m.

Finish 8:00 p.m.

Venue: Glen Dimplex, Stoney Lane Whiston Prescot
Merseyside L35 2XW

Speakers: *Phil Harris, Manufacturing Director*

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www.theiet.org/events

Introductory presentations on advances in medical refrigeration appliances and New Product Introduction (NPI) planning for domestic appliances introducing more SMART technologies to cooking technologies. The presentations will be followed by a factory tour in groups and a Q/A session.

Online registration required / CPD 2 hrs

Contact: Michael Gilbert, Michael.Gilbert@ietvolunteer.org

Cyber Security Conference

Date: Monday, 11th November

Time: Start 5:30 p.m.

Refreshments and Networking 5:00 p.m.

Finish 8:00 p.m.

Venue: Molloy Auditorium, University of Chester,
Parkgate Road, CH1 4BJ

Speakers: Multiple – TBC

The conference follows previous conferences held by the STEM society in previous years. It is open to students of University of Chester but also students from other educational institutions, members of the Chester Ethical Hackers society and the IET, as well as individuals from industry and law enforcement. The event in previous years has proven popular with individuals from local industry – with free refreshments available the conference makes for the perfect networking event.

For more information please contact the Chester Ethical Hackers committee on admin@chesterhackers.co.uk

Online registration:

<https://chesterhackers.co.uk/events/pop-ax-conference-2019>

/ CPD 2 hrs

Contact: Alex Edwards, 1712879@chester.ac.uk

Latest Developments in Energy from Waste

Date: Tuesday, 12th November

Time: Start 7:00 p.m.

Refreshments and Networking 6:30 p.m.

Finish 8:30 p.m.

Venue: STFC Daresbury Laboratory, Cheshire, WA4 4AD

Speakers: Tom Woods, Senior Electrical Engineer SUEZ

Recycling and Recovery

General waste or residual waste, is material from businesses and households that cannot be recycled. Waste has invariably been disposed of in landfill sites and some general waste is still disposed of this way. Advances in technology now mean that there are several alternative ways of dealing with general waste, which can ensure that value – usually in the form of energy – is recovered from it. Where mixed wastes remain after recycling, or it is not practicable to reclaim the materials, the energy value of these resources can be recovered safely, using modern energy-from-waste technology.

Registration by email / CPD 2 hrs

Contact: Bob Green, bob.green@se.com

A History of Bromborough Port

Date: Thursday, 14th November

Time: Start 2:00 p.m.

Refreshments and Networking 3:30 p.m.

Finish 4:00 p.m.

Venue: Inglewood Manor Hotel, Ledsham,
South Wirral, CH66 8PF

Speakers: Gavin Hunter

Located at the mouth of Bromborough Pool, the dock allowed large ocean-going vessels to berth. The port is owned by the manufacturer Lever Brothers (and its successor Unilever). It served the company's factory at Port Sunlight. The facility was once the largest private dock in the world. Gavin will present an illustrated talk about the history of Bromborough Port including Prices' Candle Works, Bromborough Pool Village, Bromborough Dock, Magazine Village, and Bromborough Hall.

Registration not required / CPD 2 hrs

Contact: Keith Done, keithdone@gmail.com,

01948 820080 / 07774 192591

December 2019

The Developing World of IoT Applications and Emerging Communications Technologies

Date: Tuesday, 3rd December

Time: Start 6:30 p.m.

Refreshments and Networking 6:00 p.m.

Finish 8:30 p.m.

Venue: YMCA Wirral, 56 Whetstone Lane,
Birkenhead, CH41 2TJ

Speakers: Mike Stirling, Technical Director,
Taylor Dowding Innovation Limited

The Internet of Things, more usually called the IoT, is a network of smart objects and cloud infrastructure which collects sensor data and converts the information into intelligence that can be used to benefit end-user operations. Low Power Wide Area technology (LPWA) is a collection of wireless technologies that are best suited to machine to machine (M2M) applications and IoT devices. Mike Stirling will build on this approach and explain the various solutions that are being developed and their individual merits in respect of bandwidth requirements, security and suitability for purpose.

Registration not essential but requested by email or telephone / CPD 2 hrs

Contact: Gordon Nicholas, Gordon.nicholas@btinternet.com

07850 725 861

FREE EVENTS OPEN TO ALL

Register online at

www.theiet.org/events

Technical Visit to CNC Robotics Ltd – Automation Insight

Date: *Wednesday, 11th December*

Time: *Start 5:30 p.m.*

Refreshments and Networking 5:00 p.m.

Finish 8:00 p.m.

Venue: CNC Robotics Ltd, 3B Olympic Way, Aintree, L30 1RD

Speakers: *Michael Gilbert,*

Development Engineer CNC Robotics Ltd,

Philippa Glover,

Managing Director CNC Robotics Ltd,

Peter Storey

Autodesk Manufacturing Applications Engineer

CNC Robotics Ltd, the UK's leading robotics integrator, will be hosting a series of technical talks on robotics and automation geared at current technology trends and the digital transformation journey. Experts will be on-hand to guide you through the current projects being carried out at CNC Robotics, and share their predictions on the future trends in manufacturing. There will be a series of presentations by members of the CNC Robotics team as well as external partners followed by a Q&A session and refreshments

Online registration required / CPD 2hrs

Contact: *Michael Gilbert, Michael.Gilbert@ietvolunteer.org*

Ben Walker, ben@cncrobotics.co.uk

January 2020

Professional Registration Evening Workshop

Date: *13th January 2020*

Time: *Start 5:00 p.m.*

Refreshments and Networking 4:30 p.m.

Finish 8:00 p.m.

Venue: 6th Floor Conference Room,

Electrical Engineering and Electronics Building,

University of Liverpool, 9 Brownlow Hill,

Liverpool L69 3GJ

Speakers: *Lou Parfrey LN Manager*

for the North of England and

Professional Advisors

The workshop will give IET members/non-members the opportunity to have an individual appointment with an advisor to discuss their professional registration.

Online registration required / CPD 1hr

Contact: *Lou Parfrey L.Parfrey@theiet.org*

FREE EVENTS OPEN TO ALL

Register online at

www.theiet.org/events

Events for Your Diary 2020

Technical Visit to Swinton Electro Plating

Joint Event with the Surface Engineering Association
Date: *5th February 2020*

The Power and Possibilities of the Digital Twin

Date: *25th February 2020*

IET MWC Leadership Seminar 2020

Date: *11th March 2020*

Sensor Technologies: Engineering at Liverpool John Moores University

Date: *11th March 2020*

Present Around the World

Date: *16th March 2020*

Digital Transformation of the NHS

Date: *31st March 2020*

Technical Visit to Jodrell Bank

Date: *20th April 2020*

Advanced Electrical Demand Management Systems

Date: *28th April 2020*

The European Spallation Source

Date: *5th May 2020*

Robotics and Automation for Industry

Joint Event with the Liverpool John Moores University and the University of Liverpool
Date: *13th May 2020*

Advances in Electronically Active Textiles

Date: *4th June 2020*

Women in Engineering

Date: *23rd June 2020*

Using Combined Heat and Power to Reduce Electricity Costs in Business

Today

Date: *22nd September 2020*

Life Skills

Date: *12th October 2020*

Presentation on The Hartley New Hospital

Date: *27th or 29th October*

Technical Visit to the School of Engineering, University of Liverpool – Biomedical Engineering
Date: *4th November 2020*

Cyber Security Conference

Date: *16th November 2020*

Cyber Security for Electrical Power Technology

24th of November 2020

The Red Box – the History, Evolution and Future of the Phone Box
Date: *1st December 2020*

Christmas Lecture

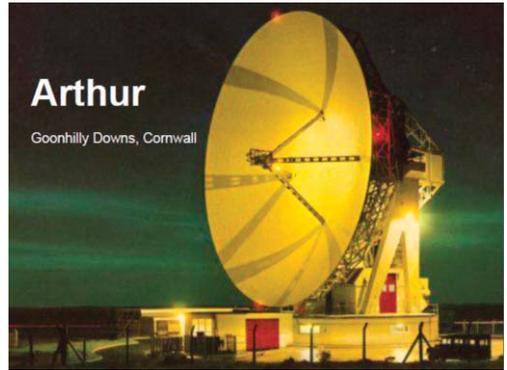
Date: *14th December 2020*

Fifty Years of the Telecommunications Satellite

On Tuesday 30th October 2018, Professor Nigel Linge from the University of Salford, presented an in-depth story of the development of communications satellites. He described how Arthur C. Clarke in 1945, published an article in *Wireless World* that suggested that "extra-terrestrial relays" could be used to enable world-wide telecommunications. He then went on to describe how in October 1957, the Russians launched "Sputnik 1", a metal sphere which orbited the earth every 96 minutes. This was followed by Sputnik 2 and the US-launched Explorer 1 and Vanguard 1 which is still in orbit and the oldest surviving artificial satellite. Nigel made particular note of the inner and outer Van Allen radiation belts between 1000 and 25 000 miles out in space comprising electrons and protons which necessitate special protection measures for the electronics and other radiation-sensitive payloads. This latter point is particularly relevant when considering the follow-on launches of observation and spy satellites, these latter devices requiring film to be sent back to earth.

Nigel then moved onto the development of telecommunication satellites and mentioned SCORE (Signal Communication by Orbiting Relay Equipment), an audio tape broadcast device and project ECHO, a metallised balloon some 100ft in diameter which acted as a passive reflector. The first "true" telecommunications satellite was TELSTAR, launched in July 1962 from Cape Canaveral. This satellite had an elliptical orbit and completed each orbit in two hours 37 minutes which gave a communications "window" of 20 minutes. Earth stations were at Andover (USA), France and Goonhilly in the UK and required tracking antennas. The Goonhilly station used a parabolic antenna called "Arthur", 85ft across and weighing 870 tons!

Various "firsts" were achieved in July 1962, these being the reception of clear TV pictures from the USA, the first



transatlantic telephone call and the transmission of colour TV. TELSTAR remained in service until February 1963 and is still in orbit today!

The presentation then moved onto geostationary and geosynchronous orbits and how they are placed at 22 236 miles in space and complete their orbits in 23 hours 56 minutes which is the equals rotation period of the earth. Syncom 2 (1963) and Syncom 3 (1964) were followed by Early Bird (Intelsat 1) which was the world's first geosynchronous telecommunications satellite, launched in June 1965 and in service for four years and was capable of carrying 240 telephone circuits or one TV channel.

Nigel concluded his extremely informative presentation with a brief description of "spot beam" technology and an indication of how the requirements for higher definitions affect the numbers of channels that can be delivered. He also highlighted the increasing problems of "space junk" and how this is being addressed.

Brian Clark OBE, Gordon Nicholas

Digital Audio Broadcasting (DAB)

On Tuesday 4th December David Crawford came to the Birkenhead YMCA to give a presentation on the subject of digital radio in the UK. Dave, until his retirement, worked as a Supervisory Engineer for Arqiva, a British Telecommunications company which provides infrastructure and broadcast transmission facilities in the UK and Republic of Ireland. As such therefore he had been working at the very centre of digital transmission technology at various locations in North Wales. Now retired, David is a Trustee and Curator at Wireless in Wales Radio Museum in Denbigh as well as Chairman of the Wales North IET LN.

David explained how research started in 1981 with early BBC transmissions beginning in 1995. Since then some 41 different countries have taken up DAB, in particular the UK and Denmark. He noted that later implementations of DAB use DAB+ as a consequence of technology development.

The commercial and technical benefits of DAB were outlined. DAB gives more channels hence more choice. It is

relatively easy to start a new station and it has good immunity to interference and fading which is good in a mobile environment. As part of this discussion Dave described the non-digital radio solutions that we currently use, particularly AM and FM radio. AM radio is particularly susceptible to fading and variable reception as night falls and FM is very "bandwidth-hungry".

David then outlined the bandwidth used by the various UK stations. A Compact Disc (for reference) uses 1.4 Mbp/s but Radio 3 operates with 192 Kbp/s and Radio 5 with 80 Kbp/s. David then explained how various technologies such as Audio Compression are deployed to get Data Rate Reduction to improve efficiency.

Dave then completed his talk by a brief description of how a Single Frequency Network is used with GPS playing an important part in synchronising the transmissions.

All in all a highly technical talk made easier to understand by David's expertise in the subject.

Brian Clark OBE, Gordon Nicholas

Advanced Process Control to Maximise Capacity and Improve Energy Efficiency

On the 26th of February 2019, Geoff Lewis from AVEVA provided a very interesting presentation explaining what advanced process control is and how it meets the requirements of industry today.



In essence this is a method of process control that uses mathematical models of process behaviour to predict and control variation.

It consistently drives the process to an optimum operating point (maximum throughput, minimum energy consumption, etc.) and is implemented in a supervisory manner relative to the existing basic control system (PLC, DCS).

SimSciAPC is AVEVA's software package for the implementation of Advanced Process Control (APC).

Typical benefits for industrial processing:

- 1-3% increase in throughput.
- >3% reduction in specific energy consumption.
- Optimising process operation under conventional control is difficult.
- Product quality measurements are infrequent.
- Control actions interact with each other.
- Time delays prevent accurate adjustment.
- Disturbances are frequent (especially ambient conditions).
- Optimum conditions are unknown.

Process Optimisation

Typically the process is operated to a recipe: a set of conditions that ensure in-specification product at all times.

Optimising process operation under conventional control is difficult due to:

- Product quality measurements are infrequent.
- Control actions interact with each other.
- Time delays prevent accurate adjustment.
- Disturbances are frequent (especially ambient conditions).
- Optimum conditions are unknown.
- Hence the process may well be operated at low efficiency giving.

- Low throughput.
- High "give-away" on product quality.
- High energy consumption.

APC has two primary functions:

1. Minimise process variability.
2. Consistently push the operating point towards the constraint that currently limits unit performance.

These two functions focuses the process on to the optimum operating point.

SimSciAPC is AVEVA' software package for the implementation of Advanced Process Control (APC) and provides the following information to achieve the improvement in the process efficiency:

- Multivariable model-predictive dynamic control.
- Steady-state economic optimisation by Linear Program (LP).
- Inferential "soft sensor" modelling by neural network.
- OPC connectivity to all DCS/PLC systems.
- Web interface for remote monitoring and intervention.
- Integrated data capture and historisation and trending.

SimSci helps the process engineers by providing the following information:

- Represents the actual responses of the process as a multivariable dynamic model.
- Each model predicts the direction, "shape" and size of the response.
- The model is obtained by performing a series of step tests on the process.

Typical Project Life Cycle

Install SimSciAPC software at customer site and commission OPC data communications interface.

Perform dynamic process response testing and create multivariable mathematical models from test data.

Generate model-predictive control and optimisation applications and deploy MPC controller at site and integrate with basic controls (DCS).

Build operator interface, train operators, commission MPC and provide performance test.

For typical application (power boiler) project duration 3-4 months, approx 70% of this time is at customer site. Advanced Process Control is a well-established technology to help end-users maximise their asset performance.

Conclusions

Advanced Process Control is a well-established technology to help end-users maximise their asset performance, benefits have been widely demonstrated and validated to provide maximise capacity and minimise energy consumption. This is a full-function package for the development, implementation and support of APC.

Robert Green

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The IET Enterprise Partnership Success Stories – Local Network



Following on from my article in the January 2019 newsletter I wanted to share some of the success stories from within the region in collaboration with our Enterprise Partners. Broetje Automation and CSA Group have both joined as partners from the Cheshire region in 2019. Here is what CSA had to say about it:

“CSA are committed to the development of our employees and have joined with the IET as an Enterprise Partner to support the continuing professional development of our technical staff. This will enable our engineers to become professionally registered giving them industry recognition of their achievements, and knowledge resources to remain up-to-date with what is happening in the field of engineering.”

We are committed to supporting any SME within any engineering discipline and with help from Matt Barber (who leads up the Enterprise Partner team) the North West has shown just how many incredible businesses there are here. A successful partnership comes down to several factors and there are a number of benefits available to SME's in the region.

Why become an IET Enterprise Partner?

The IET Enterprise Partnership focuses on providing a platform to represent SME's in the industry. Below is a list of benefits from an extensive range of partner privileges:

Business Exposure

- Access to IET's wider engineering community (Corporate, Academic and MOD/Armed Forces).
- Networking opportunity with like-minded organisations including academia.
- Raise your profile as potential recruiter through MOD Partners and Academic Partners.
- Invitations to exclusive partnership events.
- Speaking opportunities at IET events to raise awareness of your products and technology.
- Dedicated IET account management to keep you informed of upcoming opportunities with the IET.
- PR opportunities in IET publication, events and through communities.
- Discounted venue hire including opportunities at IET London: Savoy Place.

Staff Development

- Opportunity to implement a structured pathway to start a culture of professional registration.
- Discounts on books, courses and extensive knowledge resources.
- Opportunities to be involved with IET communities to increase knowledge.
- Opportunity to share your expertise and shape how the IET's learning and development solutions will be shaped in the future.

We do understand that every business is unique and their requirements from IET partnership would also be different. We therefore provide consultation through one of our expert account managers to create a bespoke plan, which aligns with your business objectives.

I am interested, but does my business qualify for IET Enterprise Partnership?

IET Enterprise Partners is available for an SME based in the UK that is committed to supporting its engineers. You will be required to fund an annual membership base of at least 15 engineers to be eligible to become a partner.

IET Enterprise Partners and the Merseyside and Western Cheshire Local Network

Throughout 2019 the IET Partnership and Development team have been speaking with the local network about ways we can interact. The team's goal is to identify more SMEs within the region that would benefit from becoming a Partner and in return the team facilitates links with its Enterprise Partners for the Local Network. Some examples of opportunities that have been created in other networks include:

- Enterprise Partner hosting a Present Around The World (PATW) competition at their facility.
- Providing site tours and technical lectures.
- Linking with Academic Partners.

We understand that involvement from young professional engineers is high on the agenda for a local network and with that in mind we are aiming to hold an event at one of our academic partners within the region where we can invite local businesses, SMEs and the students at the universities, with an aim to have a structured networking event where each group can learn more about each other.

If you would like to discuss Enterprise Partnership with one of our account managers, then please email me: matthewwalton@theiet.org or ring on 07725207931.

Matthew Walton

FREE EVENTS OPEN TO ALL
Register online at www.theiet.org/events

Local Area Network Key Contacts

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Newsletter Editorial Board: Rob McDonald, Andrew Kaldos			

Can't find the contact you need?

You will find contact details for each event in the event synopsis on pages 12-14

IET Mersey and Western Cheshire Network Social Media

The use and support of social media is a great opportunity to expand and improve communication and updates between members, share knowledge, advertise events, as well as develop a forum for all involved to spread the word of the local network and what it stands for.

The Social Media Manager would encourage all members who would like to be involved in growing the presence of the Local Network to take an active approach in getting involved.

You can connect to your preferred group using the details below and contribute to the growing presence by sharing event feedback, pictures, comments and sharing event information.



Find us on **LinkedIn**
 by searching for:
The IET - Mersey & Western Cheshire



Find us on **LinkedIn**
 searching for:
IETYSMWCNetwork



Find us on **Facebook**
 searching for:
The IET - Mersey & Western Cheshire

Local Network Marketing / Advertising Manager

The Local Network would like a volunteer to help the network generate high quality, appropriate marketing of events and generate advertising in our bi-annual Newsletter.

If you are interested in helping the network in this way please contact Rob McDonald, Local Network Chair, email robert.mcdonald@ietvolunteer.org.

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Contact
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robert.mcdonald@ietvolunteer.org
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