

INSTITUTION OF ENGINEERING AND TECHNOLOGY OPENS UP THE WORLD OF FORMULA 1 TO PEOPLE IN INVERNESS

Submitted by Iain King



Jackie Christie, one of the many personnel responsible for keeping a Formula 1 car in race trim opened up the doors to the world of Formula 1 at The IET's Prestige Lecture in Inverness on Wednesday 7 December.

The oversubscribed one-off event, where people also had the chance to see a Formula 1 car and several working components up close, had seen unprecedented demand for tickets – with organisers forced to change venues in order to accommodate the hundreds of people wanting to attend. Adverse weather conditions didn't dampen the spirit of the event with a bumper attendance in excess of 240 people. Some travelling from as far as Edinburgh, Aberdeen, Kyle of Lochalsh and indeed Northern Ireland to be in attendance. Jackie presented on many different elements of Formula 1 including Team structure, life on the road, a typical race weekend agenda, in depth car design, logistics and the factory.

After the event Jackie commented, "I was extremely pleased with the response and size of the turnout tonight. The quality of questions was outstanding. Formula 1 is often seen as the remit of glamorous drivers, but engineers who build and maintain the cars play just as vital a role. We wanted this event to give people a taster of what working in

STOP PRESS

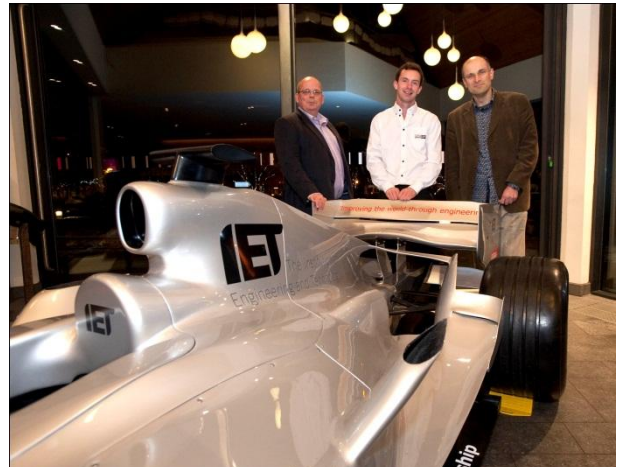
Have you got your tickets for the IET Scotland 2012 Annual Dinner to be held on 2nd March in Aberdeen at the Hilton Treetops Hotel?

See details inside ScotNews

Formula 1 is really like and hope it will have given people more of an insight. I hope it will have helped inspire the audience.”

The event, the Scotland North Prestige Lecture 2011, was a collaboration between the Institution of Engineering and Technology (IET) and Institution of Mechanical Engineers (IMechE). STEM Highland were also represented at the event.

“Formula 1 is a sport that is pushing boundaries in engineering. In the Highlands today, engineering boundaries are being pushed with many innovative ideals in many companies. Tonight’s presentation has caught the imagination of and inspired people of all ages to explore what they can do as individuals and as engineers. We’re very grateful to Jackie for coming to Inverness to share some of the adventure with us”, reported Iain King, IET volunteer event organiser.



Ian Nicoll (IET), Jackie Christie (speaker), Iain King (IET) and F1car

Ian Nicoll, IET volunteer event organiser said, “It is a great illustration of the IET’s success in Inverness that we could have filled a 266 seat venue twice over on a wild and icy winter’s evening. This event built on efforts of local volunteers over the last couple of years to promote engineering to an increasingly wide range of members, fellow professionals and members of the public from school pupils to pensioners.

We all felt like VIP guests as Jackie took us through the nitty gritty of F1 and the 78 team members needed at the trackside to allow two drivers to spin round 70 laps at 200km/hr. I know being able to handle featherweight F1 carbon fibre and alloy components and discussing them with Jackie was one of the highlights for many young people. One member at the other end of the age spectrum was spotted rekindling his youth as he squeezed into a F1 cockpit for a cherished photograph. Jackie inspired us all.”

“It has been a fantastic turnout from people of all walks of life tonight who all share a common interest in Formula 1 and Engineering. Jackie has a lot of passion for his job and the sport, he provided inspiration to an enthralled audience. It is also great to see how Engineering is growing and thriving in the highlands and we hope that events such as this will help continue this trend. We can’t thank Jackie enough for all he has done for the event.” reported Ryan Magennis, IMechE event organiser.

YOUR CONTRIBUTION IS VALUED

By Andy Till

All the content provided by members makes its way to IET ScotNews and on occasions on to other outlets e.g. E&T News. Where we have details of the contributor we try to acknowledge accurately. As a result Ifan Jones advised me that one of the articles in last ScotNews about the Arqiva Blackhill Transmitter was incorrectly attributed to him. The article had in fact been produced by Heather Rogan. I hope Heather accepts my apologies.

If you have a story for ScotNews, would like to advertise a future event, or simply want to pass us your thoughts about the publication, please send information to Andy Till (andy.till@bp.com).

JOINT IET, ITP CHRISTMAS LECTURE 2011

Submitted by Paul McKenna

The IET Christmas Lecture for 2012 was held on Saturday 3rd December in partnership with the ITP. One hundred plus IET and ITP members, their family and friends enjoyed a fantastic Family Christmas Presentation by Dr Mark Lewney.



Mark introduced his audience to the physics of vibrations, string theory and everything from nano-size to several-universes-large. Mark ended with a space-time visualization of the Universe and the exciting opportunities about to be unfolded by the Large Hadron Collider in Geneva.

As you can tell, this was no ordinary lecture. It was loud fun, musical, entertaining and extremely interesting. From start to finish the audience were captivated by the presenter and his subject. The maths might be a little over our heads but he got the concepts across in a highly entertaining manner.



As the audience entered the lecture hall at Glasgow Caledonian University, they were greeted by powerful guitar music. This was indeed good stuff and very much appreciated by an audience of all ages and tastes. There was even an impromptu request section for younger members of the audience before the lecture proper started.

Once everyone had arrived Mark led them into a subtle but educational presentation of vibrations, atomic and quantum particles and how the whole universe is made of music in 11 dimensions. Using music, humour and a lot of serious enjoyment he took us through a journey which started with a demonstration of a pulse of air (using an air bazooka) and ended almost all the way to understanding string theory.

Concepts of sound and motion, the human voice, the conversations of whales, sonic waves from a bullwhip to waves from earthquakes introduced the audience to general vibrations of waves under constraints of length, mass and tension. The complexities of musical harmonics and the notion of simple sine waves opened new ways of looking at the universe. The excursion from the physics of guitar strings to string theory was painless as Mark explained concept after concept with fun interactive demonstrations. Many of the children took to the stage to help demonstrate various concepts. Visualising the guitar string shrinking to a point under infinite tension was easy and with a tension of the order of 1039 tons we had arrived at the superstring.



Mark ended with a message to the younger members in the audience of the benefits of careers in Engineering and Science as opposed to less 'serious and rigorous' disciplines. His exact words were a bit less complementary but I refrain from putting them in print. <http://www.doctorlewney.com/>

DATES FOR THE DIARY

From IET Scotland Web Site

Date	Event	Location	More Details
1st February 2012 (14:00)	Forth Replacement Crossing (including the New Forth Road Bridge)	Castle Room Craighouse Edinburgh Napier University	http://www.theiet.org/local/uk/scotland/southeast/forthroadbridge.cfm
8th February 2012 (14:30 for 15:00)	Windfarms On and Off-Shore	IET Glasgow: Teacher Building 14 St Enoch Square Glasgow G1 4DB	http://www.theiet.org/local/uk/scotland/southwest/swrm-windfarms.cfm
15th February 2012 (17:30 for 18:00)	Sunspots and Geomagnetically Induced Currents and their Effects on Power Systems	IET Glasgow: Teacher Building 14 St Enoch Square Glasgow G1 4DB	richard.boyle@strath.ac.uk
3rd March 2012 (19:00 for 19:30)	IET Scotland Annual Dinner	Hilton Treetops Hotel 161 Springfield Road Aberdeen AB15 7AQ	http://www.theiet.org/local/uk/scotland/north/annual-dinner2012.cfm
13th March 2012 (18:30 for 19:00)	The History of the Laser: A Practitioner's View	Royal Botanic Gardens Administration Buildings 20A Inverleith Row, Edinburgh. EH3 5LR	http://www.theiet.org/local/uk/scotland/southeast/lasers.cfm
10th April 2012 (18:30 for 19:00)	Manufacturing technical visit to Thales UK	Dundee	jack.lord@ajustworld.co.uk
8th May 2012 (18:30 for 19:00)	Sir Barnes Wallis: An Engineer 50 Years Ahead of his Time	Apex European Hotel , 90 Haymarket Terrace, Edinburgh EH12 5LQ	http://www.theiet.org/local/uk/scotland/southeast/agms.cfm

ARE YOU 'LINKEDIN' IN ABERDEEN?

Submitted by Leigh Regel



The aim of the Younger Members section is to create a network for the next generation of engineers to meet and discuss the topics and themes which are of greatest importance to them. Throughout the year we organise a range of events which we believe hold particular interest to students, graduates and young professionals living and working in the Aberdeen area. Activities can range from anything from presentations and interactive workshops through to informal social events. Please see our 'Younger Members Aberdeen' [Facebook](#) page and the 'Scotland North' [LinkedIn](#) page for an up to date list of upcoming events.



The Younger Members committee is responsible for arranging the program of events for each year. We hold regular monthly meetings, normally on the 2nd Thursday of every month at the Old School House, Belmont Street. Meetings are relaxed and friendly and we are always delighted to welcome new people who have an interest in helping shape and run upcoming events. Feel free to check the next committee meeting date and time via the above links and just come along, or drop us an email if you would like to know more.

Nearly all events are free of charge and are available for you register for via the main IET website. We hope there's something in the events line up that sparks your interest and we look forward to seeing you at our next event very soon.

E, C AND I PODCASTS

From the IET Scotland Web Site

Thermoelectrics, by Professor Douglas Paul of Glasgow - discusses up-to-date generation of electricity from waste heat.

Thermoelectric generation and its converse, Peltier cooling, have been known since the 19th century. Any waste heat, especially at high temperature, can be turned into electricity - examples include car engines, furnaces and many more. This energy source would be extremely "green" as no extra fuel would be required, even more so if the devices were made of plentiful materials. Better cooling devices would also be available - for example, as well as reducing the kilowatts of electrical power needed to cool computers, electricity could be recovered and used to even further reduce power consumption. This is effectively recycling energy, instead of "paying" to take the waste away.

IET Scotland Technical Network EC&I produce the Monitor audio magazine, a series of podcasts, which are ten-minute interviews on hot topics. These can be downloaded from:

www.theiet.org/local/uk/scotland/eci/podcasts.cfm

An email service is available to notify you of new topics when they are added.

MANUFACTURING TECHNICAL NETWORK VISIT: SELEX GALILEO

The Manufacturing Technical Network visited the Selex Galileo facility in Edinburgh on the evening of 19th May 2011. Tour leaders, Bill Sinclair and David Wilson, took the visiting groups around the large and impressive facility after presenting the company and its place in the Finmeccanica organisation. The Crewe Toll plant is probably well known to most engineers with its development from Ferranti to Marconi, BAE Systems and now Selex Galileo. There are 1900 employees on site with 1200 engineers or project managers. Turnover is Euro 6718 million and is concentrated on defence and security electronics.



As defence industry manufacturing is based in secure clean room environments we viewed the processes and products through large display windows. The open plan layouts were impressive for their neat, tidy appearance reflecting the strong lean/six sigma philosophy. The company has achieved many awards for export success and innovation, culminating this year with the Queen's Award for Innovation .

An absorbing visit which brought out the complexities of the manufacturing process and the undoubted enthusiasm of the employees who work in the facility.

WANTED: YOUR SUGGESTIONS FOR TECHNICAL OR PROFESSIONAL EVENTS IN SCOTLAND.

Can you suggest a technical or professional topic that would be of interest to IET Members in Scotland? The Scottish Technical Networks are very keen to find out what Members want, such as technical podcasts*, lectures or seminars, visits, initiatives with the wider community, etc. You may also have ideas on where in Scotland the event should be run to attract the most interest (either an area or a specific location).

Suggestions on any topic within the scope of the IET are welcome; we will share them across all the Technical and Local Networks.

Please email your suggestions, stating:

For a podcast*, lecture or seminar:

- the topic or theme
- potential speaker(s), organisations, etc. to take part
- possibly a suggested venue or area

For a visit:

- the location and theme
- For any other type of activity:
- what, where, who?

to: wrwright@theIET.org with subject line "Scottish Technical Event".

For some examples of IET Scotland podcasts, please see:

<http://www.theiet.org/local/uk/scotland/eci/podcasts.cfm>

IET SCOTLAND ANNUAL DINNER

Submitted by Dave Wilson, Chairman IET Scotland

IET Scotland is holding its Annual Dinner in the Hilton Treetops Hotel, 161 Springfield Road, Aberdeen, AB15 7AQ on the evening of Friday 2nd March 2012 at 7.00pm for a 7.30pm start. The President of the IET will be attending along with a number of guests.



As Chairman of IET Scotland, I would like to invite you and your guests to attend. The price of a ticket is £45 per person and tables can also be booked for between 8 and 12 people. If you require more information please follow the link below, but if you need any further information please do not hesitate to contact Andy Till (andy.till@bp.com) or submit an application form which can be found at:

<http://www.theiet.org/local/uk/scotland/north/annual-dinner2012.cfm>

MANUFACTURIN TECHNICAL NETWORK VISITS

Submitted by Jack Lord

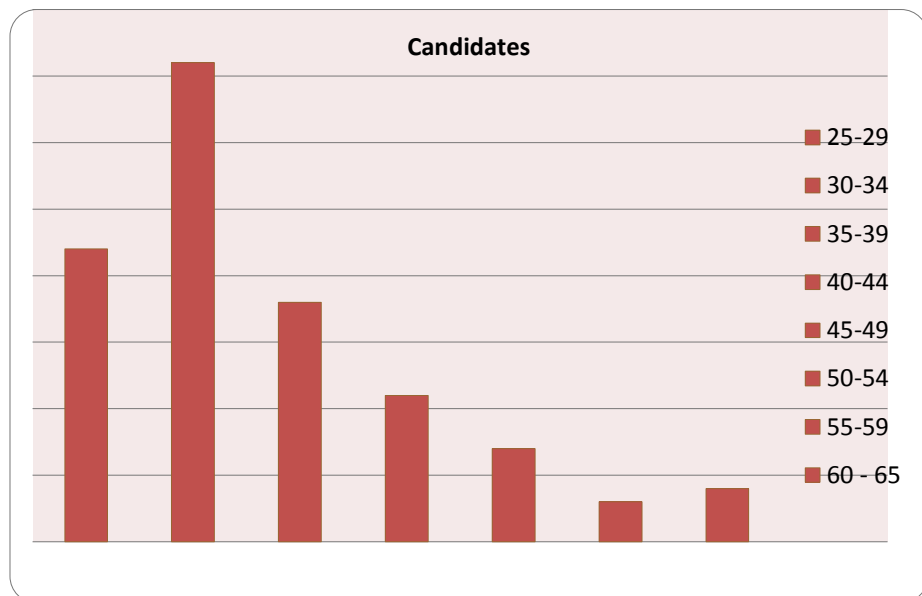
The next Manufacturing Technical Network Visit to Howden Process Compressors Ltd, will be held on the 14th February, 18.30 for 19.00. For more information contact Jack Lord jack.lord@ajustworld.co.uk.

The Manufacturing technical visit to Thales UK on Tuesday, 10th April has been changed to Michelin Tyre, Dundee, to see their on-site wind turbines and advanced manufacturing plant. As usual, meet at 18.30 for 19.00. This meeting will be held jointly with the Scotland North.

PROFESSIONAL REGISTRATION - A CENTURY ACHIEVED

Submitted by Ron McMurtrie

One Hundred Candidates interviewed in Scotland between October 2010 and September 2011. A magnificent effort made possible by the PR Interviewers' willing co-operation. Of the 100 candidates 81 were seeking CEng registration and 19 I Eng. Having highlighted in the 2009/10 Report the increase in the candidates from the 25 - 29 age group, the past 12 months has seen this maintained. What is much more striking is the almost 100% increase in candidates from the 30 - 34 age group. Members within the age range that the IET has expressed concerns regarding retention of Members.



In 2010/11, Glasgow was the venue for 14 dates, Edinburgh 10, Aberdeen 6, and one in Dundee. Over the twelve months, 37 Interviewers volunteered their services, of which 15 participated in 2 dates, six in 3, and two in 4. An upward trend that will continue based on the steady increase number of applications for Professional Registration.

The introduction of a presentation by candidates has proved largely successful with a wide range of interesting topics being described. Presentations enable candidates to make a much more assured approach to their interview through being able, through project descriptions, to demonstrate practical examples of their technical knowledge and understanding.

Matching Interviewers to candidates continues to be a challenging task in the light of the Institution's attractiveness to the wider engineering community. Inevitably several Interviewers decided it was time to 'retire', always a matter of regret in the light of their much-appreciated contribution over quite a number of years. A personal contribution formally recognised by the IET.

Fortunately other Members have been found who are willing to help to take the place of those Interviewers who have 'retired'. Finding members interested in being involved in this particular IET activity is not easy, despite suggestions being made as to who might be approached. Also there is a need broaden the range of engineering disciplines now required to be covered in line with the IET's five Sectors, Built Environment, Design & Production, Energy, Information & Communications, and Transport. The lack of sufficient IEng Interviewers in Scotland continues to lead to delays in arranging interviews and a dependence on suitable Interviewers being prepared to travel to Scotland.

Charting the ages of candidates interviewed in Scotland highlights the already mentioned very considerable increase in candidates in the 30-34 age group, while the number of candidates aged 35 and upwards shows a decline compared to the previous 12 months.

Availability of completed Inquiry Forms (Form IF) has improved considerably. On the plus side the re-design of this form has resulted in an improvement with more Supporters giving considerable thought to their assessment of the candidate being supported and detailing their relationship with the candidate. These independent assessments give further insights into a candidate's competence, additional information welcomed by the Interviewers.

The invitation to candidates to provide an assessment of their interview continues to demonstrate some 90% satisfaction with the manner in which interviews are conducted.

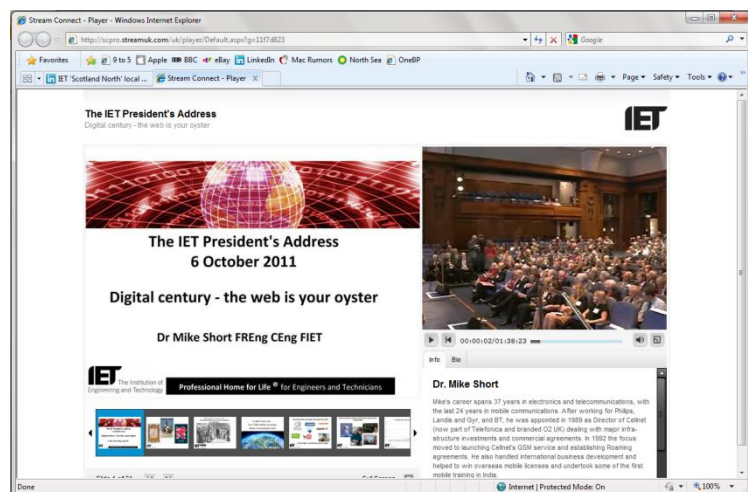
My task as Interview Convener continues to be both enjoyable and relatively easy through the much-appreciated support of the Interviewers. The ever-willing co-operation of IET Standards and Registration staff is another major factor. A continuing excellent example of how a direct, effective working partnership between Members and IET staff can prove to be both efficient and successful.

Candidates equally deserve a thank you, being in the main, amenable to accepting the interview date offered and, on occasion, an alternative venue, quite often at fairly short notice. Work pressures and previously arranged holidays continue on occasions to make acceptance of the date offered understandably unacceptable.

On a lighter note, shredded applications continue to be given to the SSPCA's local Animal Rescue Centre; perhaps a more unusual contribution to the IET's Community Engagement and the Sustainable Environment.

HAVE YOU LOOKED AT IET.TV RECENTLY?

The video content continues to expand on the IET.tv web site. Recent additions include the IET President's inaugural address on the 6th October 2011, titled Digital Century - the web is your oyster. With the challenging geography we have here in Scotland, it is not always possible to get to some events 'Down South'. However with a broadband or wireless link you can attend virtually. IET.tv provides integrated video, audio and slide content, to review at your leisure.



IET.tv can be found at its own microsite at: <http://tv.theiet.org/>

SOUTH EAST RETIRED MEMBERS VISIT TO VIRGIN MEDIA

From SERM November Newsletter

SERMS visits continue to be popular as the November visit to Virgin Media (VM) was oversubscribed. Numbers had to be limited due to the space between the electronics racks of the facility at South Gyle but those who attended were given an excellent overview of the history and current operation of VM's Edinburgh operation followed by a comprehensive tour of the facility.

Steve Webster, Principal Compliance Engineer, was the host for the evening and it was clear from his extensive knowledge that Steve has had first-hand experience of the wide ranging technology at VM. Steve, who is a member of the Institution, started by giving some historical background. Following the privatization of British Telecom in the 1980s the Government was keen to generate competition and, via the Cable Authority, granted area franchises for new broadband cable systems around the country.



In the Edinburgh area the franchise was awarded to United Artists (UA), a major US cable TV operator. UA spent £500m installing a cable network in the East of Scotland using US components to minimize cost and installation time. UA subsequently merged with others to become Telewest Communications. There then followed a process of consolidation of the various franchises in the UK until by the early 2000s virtually the whole industry was in the hands of two companies, NTL and Telewest.

In 2006 NTL and Telewest merged and the following year these two plus Virgin Mobile combined to form Virgin Media which is now a public company listed on the USNASDAQ and London stock exchanges. VM's use of optical fibre for high speed broadband has been a key differentiator in the very competitive UK marketplace.

Steve then went on to describe the hybrid fibre coaxial (HFC) network. Optical fibres take the signals from the South Gyle Head end to residential segment areas each with typically 500 homes. Signals are transferred from optical fibre to coaxial cable at street cabinet fibre nodes. The coax then runs through street ducts often via repeater/amplifiers to passive splitters which then feed individual houses. The current network is virtually the same as it was 15 years ago.



The TV and internet signals are amplitude modulated in the spectrum of 100 to 750MHz on optical laser diode carrier emissions at either 1310nm for short haul (15-20km) or 1550nm for long haul (20-70km). These signals are detected and demodulated at the fibre nodes and the resultant RF sent to houses via coax cable.

Steve then showed us round the hardware. The broadcast TV signals are received at the TV Head

end in South Gyle via optical fibre from the VM national Head end facility. The cable network has 54 similar regional sites like South Gyle. All UK TV channels including all regional channels are sourced centrally and distributed to homes via sites such as South Gyle. Settings in each set top box determine which channels an individual customer can view. All broadcast TV is delivered out of South Gyle from two 19inch Cisco platform racks!!

Currently there are 150 optical forwards path lasers each outputting about 10mW per laser. Each laser services up to 4 fibre nodes depending on their proximity to South Gyle.

We saw the Video on Demand (VoD) facility where video is stored on local servers using multiple failure tolerant RAID hard drives. The control system allows customers to select videos and ensures payment is made. There is also a cache of the most popular programmes from BBC iPlayer.

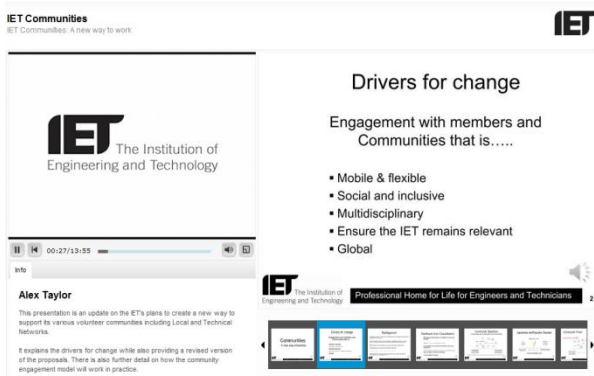
We also quickly looked in on a Nortel telephone exchange which has a 90,000 line capacity.

This report only briefly touches on the detailed technology talked about on the 3¼ hour visit. Sincere thanks go to Steve Webster for his excellent presentation, most interesting tour and for so ably dealing with all the questions. Thanks also to Virgin Media for allowing the IET to see this impressive facility.



HELP US SHAPE THE FUTURE OF YOUR COMMUNITIES

By Professor William Webb, IET Vice President



The latest development on the new community model

The IET would like to thank those of you who provided comments on our recent proposals to enhance the way we support communities in the future. Having taken your feedback into consideration, the new community model has been developed further.

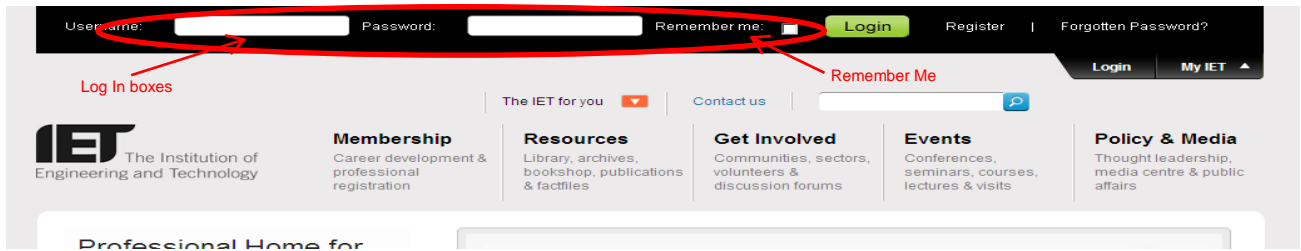
New model presentation now available

We are pleased to present you with an update of the IET's plans to create a new way to support its various volunteer communities; geographic, demographic or technical. The

[new Community Engagement Model](#) will give you more information about how this will work in practice. The presentation is in audio format and will provide further details on the processes that underpin the new model.

As we move towards implementation of the new model, we would welcome any comments you may have on the latest plans via the [Community Engagement discussion forum](#).

TOP TIPS FOR USING THE IET WEB SITE (PART 1)



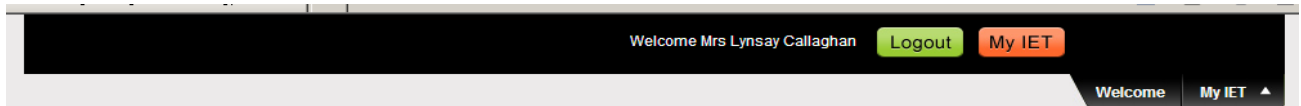
- To login you must enter your username and password into the appropriate fields in the grey bar at the top of any page.
- If you do not want to have to log in every time you return to the site then tick the “Remember me” box.
- If you cannot remember your username or password (or both) you can request a reminder at <http://www.theiet.org/help/reminder.cfm>
- From time to time you may be asked to login even though you have checked the “Remember me” box. This is because the cookie which contains your login details has been removed from your computer, for example by your antivirus programme or because you have cleared your cookies.

Navigating to My IET Communities

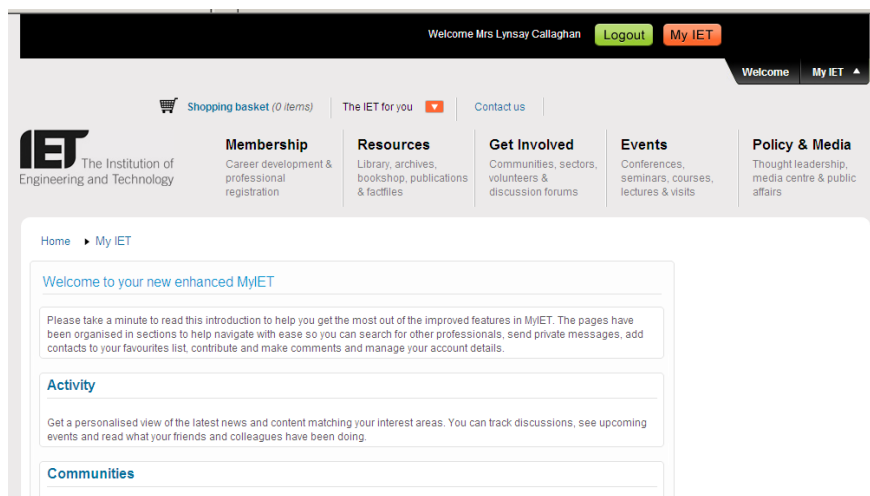
- My IET is only visible from www.theiet.org if you are logged in (see logging in). If you are not logged in you will see (in the top navigation bar):



- Once you have entered your details the screen will change to:



- The text in the bright orange box is a link which will take you to the My IET area.
- Once there you will see this screen:



This is the entrance to the new look, feel and functionality of the MyIET web site. If you have never visited the MyIET site please go and have a look / play. In the next issue of ScotNews we will have more Top Tips for using the IET web site.

RETIRED MEMBERS 'BLOWN TO BITS'

Submitted by Professor Bob Stewart



In February Bob Stewart gave a presentation titled "Blown to Bits" to the IET Retired Members Section. Bob is a Professor at the University of Strathclyde in Glasgow in the Department of Electronic and Electrical Engineering, where he runs a research group working on digital communications.

The "Blown to Bits" was essentially in reference to a project now running with key industry collaborators, British Telecom, Steepest Ascent and the BBC, on the Isle of Bute.

With the advent of the digital TV analogue to digital switchover, bandwidth will become available for secondary use. One use of this so called "white space" spectrum will be for rural broadband, very relevant to the Highlands and Islands of Scotland. Wireless internet connectivity can be poor due to long line lengths and difficulty backhaul to main points of (internet) presence.

One aspect of the project presented was on using small scale renewable energy (wind turbines - hence "Blown" and solar) powered base stations to allow white space radio devices to be placed precisely where desired. With no need for electrical power connections and entirely autonomous relay base stations, the system provided radio data connections (the "bits") to homes. In the talk Bob gave a review of white space, the demographics and technologies that are deployed in Scotland at present. Also a vision of how the advent of white space could make quite significant difference to the connectivity and therefore the social and business environments of rural areas.

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