IOP | Institute of Physics
Engineering Physics Group

NEWSLETTER September 2009

Innovation HDTV

See http://eng.iop.org for further details about the Engineering Physics Group.

A note from your chair

John Battye

Well, this is the last Newsletter for which I will be acting as the Chairman of the group and Editor of this Newsletter. IOP rules dictate a maximum of three years in the post and my time is up.

As editor I have sought not only to encourage you members on as wide a front as possible ---- because as a group you are of diverse backgrounds ---- but also to raised what might be some controversial, topical points. This has allowed me the indulgence of airing some of my personal 'gripes' about the situation concerning engineers. They really apply mostly to engineers in the UK where the situation, in my experience, is worst --- viewed on a world scale. The approach has raised some interesting responses. This edition of the Newsletter is my Partheon shot. The new editor will, I'm sure, adopt their own, probably rather different 'line'.

The main theme of this edition of the Newsletter is invention and innovation.

I got my first patent when still an undergraduate. It was in electronics and not having any money to pay such expensive lawyers as patent agents, yes essentially that is what patent agents are, technically trained lawyers --- who charge lawyer type fees ---- I did so having written the patent myself. It actually wasn't that difficult. The government provided free booklet providing guidance on how to do it was, and still is, excellent so that in my view anyone who has a reasonable command of English can do it. What is more, if the potential applicant thinks fairly flexibly they can also write a pretty strong one, i.e. one which very effectively covers the intellectual space afforded to them by the absence of prior art. To add to this I found the patent examiner, who I eventually had to confront, was most helpful and indeed eye opening as to the lack of need for convoluted verbiage and jargon as so commonly embodied in patents --- especially those by sophisticated sounding partnerships of patent agents. A typical lawyer's method of job protection! The examiner was also most illuminating, in a chatty and humorous way, about the different policies pursued by different companies, e.g. ICI (chemicals) and Philips (electronics) as regards the protection of products incorporating their inventions. I still fondly remember the smell of Dove furniture polish (that purple coloured lavender smelling stuff for those old enough to remember) on his large oak desk in the back of Southampton Buildings, Holborn, London, the UK's main patent office at the time. The UK's main Patent Office has long since relocated to Cardiff.

As a consequence of obtaining my first patent I was contacted by the Institute of Patentees and Inventors (Inst PI) who asked if I would like to join. I did, and so remained a member for several decades. I learned from their informatively helpful magazine and, when on the extremely few occasions I managed to get along to one or two of their meetings in London, I much valued what I learned from the members that I met.

In essence what I learned was that getting a patent was easy enough --- well I suppose I was canvassing a non typical sub set of the British population --- but the problem, the real problem, was how to make money out of it. I suppose to be fair the sort of person who tends to be an inventor is not usually the worldliest of people, if my non UK typical subset sample was anything to go by. I loved the members for their 'artistic' zeal and visionary mechanical pragmatism. I was concerned for many of them for what I thought to be their often impractical attachment to their ideas, 'their babies'. An attachment I thought not wholly unlike an academics attachment to his subject with an easily distorted vision of its importance in the total scheme of science, never mind the wider world! In the academic's case it at least provides a living but for most inventors their emotional attachment perhaps merely serves to promote their economic hardship, but most seemed happy enough with this compromise. There are, of course, also those few like Trevor Baylis (clockwork radio invention) and Sir James Dyson (vortex vacuum cleaner invention). The latter thus also owner of a fairly large company.

Amongst the things that were reinforced in my mind by my membership of the Inst PI was the need to tell no one, and write nothing of ones invention, except to a patent agent if one used one, before filing a patent. In essence trust no one, produce no notes or drawings that might at a later date be shown by someone to predate the filing of that patent application, for that will instantly destroy its validity.

There was a time, about thirty years ago, following a government initiative to try and help Britain's inventors, when a bevy of 'professional' agencies sprang up to offer assistance in this direction. In essence the agencies asked for inventor's to outline their ideas which they said they would review and, if they thought them patentable and commercially worthy, would support by offering assistance. This assistance usually manifested itself at various levels ranging from; (i) merely obtaining a patent, to (ii) getting the patent and contacting companies that may be able to manufacture the new product, and (iii) getting the patent, contacting possible manufacturers and negotiating with one to produce the product and reward the inventor as well as could be argued. I had a little initial dealing with such an agency concerning another invention I had many years after the one I patented as an undergraduate and as far as I was concerned they behaved honourably. That is they didn't steal my idea when I decided not to use their services. Considering the numbers of these agencies that eventually

mushroomed I am not so sure, mankind being as it is, that that could be said of all of them, especially the large number that came late onto the scene as no doubt the gravy train potential for such agencies was realised by a wider number of these 'entrepreneurs'. They were following a government initiative and as such seemed to be at the forefront of technology, the smiling face of Britain's new surge to promote technology, but it was a poor effort compared with Harold Wilson's attempt decades earlier to fan Britain's 'White Heat of Technology'. The agencies got a hand out from the government, they got healthy payments up front 'blind' from hopeful, 'baby loving' inventors or, if an inventor had only minimal money to be able to offer 'up front', the prospect of substantial payments from the winning inventions which they could hope to pick from the large turnover in their offices. In my view understandably this sort of agency had more or less faded away within fifteen years; perhaps because of lack of government support, insufficient inventors, inventors 'put off' by the swinging agency percentages required in order to get much involved or difficulty in finding real 'winners', likely all of them. The idea was too idealistic and impractical but I suppose it gave something of a living to some for a while, at the expense of others, including the general tax payer by way of subsidies.

For my initial contact with one of these agencies, which actually cost me very little, I got a flattering letter saying I had a good idea, I had described it very well and they were willing to 'take it on'. I suspected their flattery had a purpose, but it fell on stony ground as far as I was concerned. I didn't see why they wanted so much either in cash or as percentage of possible future profits to have them employ an expensive lawyer to tickle my text. That being what I suspected would be their next move if I 'signed up'. I also thought it likely the patent agent would have a special relationship with them, rather like these days firms of solicitors have a lucrative relationships with estate agents to produce the HIPS required for selling houses. I didn't think I needed the agent to tell me who might be able to manufacture a product or have them negotiate with a potential manufacturer. All were things I felt I could cope with perfectly well myself without helping them feather their nest, as I judged was their greatest interest in life. In the end I got the patent myself. Without the patent examiner once even writing to me to clarify or modify an explanation or 'reduce' a claim! I subsequently applied for and got some more patents, I thing which I seem to have a bit of a bent for.

Reading the paragraph above you may think I was excessively defensive and cynical about a number of things. Perhaps so, perhaps because even when dealing with the aforementioned agency I was older than many of you, but also perhaps you should be aware of some of the stories I heard from those other members of the Inst PI I had occasionally I met. Many had naively gone along to some company they thought might be interested in their idea and 'spilt the beans' without first protecting themselves with at least an application for a patent. If the idea turned out to be good it seemed to make no difference, whether the company

was some little outfit on an obscure industrial estate or one with a great and prestigious name. Basically an all too common occurrence seemed to be that the company 'ripped them off'. Alternatively, if the company's interest was not immediately stimulated the inventor was very quickly shown the door.

In between my above described patent applications I was involved in R&D for a manufacturer. During the course of this my boss initiated the company's use of the company retained patent agents, a London based firm, to look into what I was doing with a view to obtaining a patent. I duly wrote him a screed and signed off all rights to my employer. An agent from the firm of patent agents made a visit to our company offices, arriving by train using a first class ticket, we chatted, I corrected some bits, he expanded some others, he went away. He did this a few more times and time went by. I never discovered if the application finally went through because not long afterwards I left the company for a job far off abroad and I never bothered to probe to find the final outcome.

In total, my experience left me thinking that undoubtedly patent agents had their uses, even for one such as myself who was an inventor with some prior experience of patent application and 'the system'. However, I found it almost as difficult getting the details of an idea across to a patent agent and correcting his efforts writing it up as writing the 'b' thing myself. Those free instructional books issued by the patent office really are very good indeed.

The article by Kenneth Jones that follows this introduction to the newsletter describes, from a 'business' point of view, an interesting situation that in a way falls between the two scenario's described above, i.e. that of the completely independent inventor and that of the company employee who has 'given' life and sole to their employer. According to Ken after, over several years, having and developed ideas on what might be possible to viably record and transmit television pictures digitally it was not until he was employed as a government trainee in a somewhat complicated business relationship with a private company and the BBC, both of them powerful organisations, that he began disgorging his thoughts. In retrospect he claims to effectively be the inventor of some of the key concepts that have lead to what has subsequently been developed into the highly efficient HDTV we have today and yet to have not received appropriate recognition or material payment for his role. Having only heard his point of view I have no comment on any of his claims but at least I think it is an interesting account since in a way many of us find ourselves in something of the same situation --- all be it far less critically so --- at some stage in our lives. In a way it impinges on all of us, whether in academia or industry, for I'm sure many are in situations where our contributions are likely of value as 'intellectual property'. I can quite appreciate how a situation such as Ken refers to could occur, and what is more I should think it perhaps more likely in these days of struggling engineering companies in the UK eagerly seeking to minimise development costs

by almost any means they think they can 'throw' together, without too much consideration for the seeming minutia as regards legal consequences relating to intellectual property.

Over the years I have been struck by the passion with which this subject grips people's soles, especially in universities where at many establishments the 'problem' seems to have been very poorly addressed either by the university as a way of making money out of patents, or contractually (between the university and its staff). I think the situation is usually very clear and well handled in industry although policies seem to differ greatly from company to company.

As regards the rest of this Newsletter; following Ken's article there are some comments about obtaining Chartered Engineer status by Karl Butler and then a brief report on the visit our group had to the BMW Mini plant in Oxford earlier in the year.

Finally I remind you that a new Chair and Horary Secretary for the group has to be elected. Will those interested in either of these positions, or in being an Ordinary Committee member, please type up some words supporting your claim (less than three quarters of a page of A4, font size 12) and send it to Claire Copeland (claire.copeland@iop.org) so that she can circulate it and solicit votes. For further details see the end of this Newsletter.

The innovation of digital HDTV

Kenneth Jones

Because of its greater energy efficiency and multi-channel capacity than analogue equivalents High Definition Tele-Vision (HDTV) is a great benefit to the environment. I had realised this quite early in life but my involvement didn't really have impact until, in 1984, I began suggesting to colleagues my thinking on how bandwidth or data-rate reduction was possible. The exploited result is the video data compression (IEC: BSI MPEG) picture coding algorithm as the parental standard.

In some ways the basic physics of a digital system for transmitting digital TV can be thought of as behaving rather like Plank's well known formula $E = h \nu$ (or using 'f' for frequency $E = h f$) in that if spectrum frequency is kept low by data compression a low bandwidth is achieved for a large number of coded digital TV broadcast. There is thus a saving in both spectrum accommodation and transmission costs, which has environmental benefits.

By October of 1984 my mid-life considerations for my final-year post-degree open technology project had taken a mathematical formulation from the pilot equations into what we now most appropriately call ‘neural network logic architecture’ applied to repeat multiples of the 3-frame group video sequences A necessary requirement for optimal block compaction and retrieval of the very wide frequency bandwidth otherwise taken by the digital video signal. The now proven algebraic science of the theoretical ‘thought experiment’ was to design the source algorithm coded - motion picture extrapolation generator, abbreviated to MPEG, to regenerate the original picture sequence at destination for large scale screen display at a higher frame rate. The abbreviation ‘MPEG’ has subsequently come to loosely refer to any of the several systems developed by the, ‘Motion Picture Expert Group’.

My original fundamental MPEG bandwidth reduction system was later, after further improvement, privately patented in April 1992 as, “Bandwidth reduction employing a classification channel”, GB 2 265 783 B aimed at achieving the greater pixel matrix numbers required for the integrated fully-digital HDTV that we have today.

Also, based on the aforementioned priority date, a system for a, “Converter Unit” (GB 2 266 638 B) was filed for the purpose of converting the then standard transmission PAL 625 signals to digital form. This was seen as being necessary for an interim stage during the introduction of the new system so that those with ‘old’ analogue PAL 625 sets could receive the newly coded digital signals soon after transmission started. The implementation of such converter units have since popularly been called “Digi-Boxes”, and the separate unit design concept subsequently resulted, with much further development, in the modern ‘satellite receiver’ or “SKY Box”.

With the modifications according to the above digital TV transmission of luminance (Y, the grey scale Black & White only) pixel logic data compression reduces the suppression frame loss of all three binary RGB clusters at each source pixel to a ‘one-bit’ transmission binary for code reconstruction at the destination display. The forward one (1) binary fetch RGB pixel values are taken for the oncoming temporal adjacent video frame from stored memory, pixel by pixel, in the temporarily frozen three frames set for later re-construction at the destination to build up the full screen display.

The Eu-95 programme findings have driven today’s achievements in digital TV to a large and growing consumer market as HDTV has been warmly taken up by the general public. What is more, the future looks very bright as numerous further new performance enhancements are already ‘in the pipeline.’

My interest and ultimate involvement in all this started when in the autumn of 1965, as a sixth form school, physics pupil I visited Liverpool University. There I more fully appreciated how my interest with occasional work in radio, audio, and TV could be re-invented. I foresaw the forthcoming rush from analogue to digital electronics, the limitations of the earliest ASCI character set and the limitations of the analogue scanned raster cathode ray rube (CRT) if best use was to be made of integrating the two. However, the next step in my life took me into industry.

In industry I spent a number of years first becoming acquainted with analogue computer programming of instrumentation signals, then the competitive parallel digital computation method. I joined the BBC and, while commissioning their digital 13-channel, 13-bit sample audio distribution link system across the UK was struck by the fact that the low-noise and low signal-levels requirement to achieve high quality sound was at the expense of a video capable bandwidth. The problem which was holding back the development of digital TV was that it required far more than the full video bandwidth of a single analogue TV channel. Without signal compression the system was extremely broadcast spectrum greedy. Although TV stereo sound was subsequently transmitted using NICAM (Near Instantaneous Compounded Audio Modulation) with Hamming Code (7/11) signal protection (with reduced logarithmic mantissa and exponent signal sample values) the more reasonably contained audio bandwidth was still unattractively large.

The main problem in 1988 was how to best transmit digital television video, a very wide bandwidth signal, and achieve a far better picture than resulting from the analogue transmissions at the time. The satellite trial of the complicated Multiple Analogue Components (old MAC) method was dropped in favour of the deep compression system I invented, a system which used algorithmic bandwidth or digital, data-rate reduction. This move was further encouraged by the fact that the viability of MPEG digital transmission technique was proved in the mid 1990's.

The effectiveness of my method lay in the Boolean algebra logic network feasible approach; i.e. stripping all apparent unchanging data space redundancy from static frame sequence repetition values of stationary or unchanging pixel brightness values. The result was a relatively simple design relating to only image changes. A method now used in multiplicity to gain the deep compression of more advanced, recent versions of MPEG. One uncertainty at the time was selecting the critical threshold for detecting appropriate image movement so that a good moving picture could eventually be reconstructed. Further investigation subsequently lead to the standard IEC: BS MPEG which uses four motion classifications derived from the two in between frames or intra-field motion detection binary values, with a further motion compensation network to overcome image foreshortening errors resulting from concurrent pixel samplings.

The first computer image proof picture of the necessary pixel image motion change detection reduced to two Boolean variables from between three frames. Under 2-way differential negation this fed the subsequent combination quaternary concurrent network logic to give 'four colours suffice' screen segmentation. In development the screen morphology was programmed at Philips Electronics UK for Philips Electronics International. The computer programming, where much of the innovation lay, was done under the UK's DTI 'Eureka' programme with line Eu-95 funding given to their Surrey Research Laboratories. They worked in collaboration with the BBC's Research Department, also being based in Surrey, and with a number of trainees under government contract. These trainees, of whom I was one, were in a strange position as regards any patentable rights should they initiate patentable ideas, since when the contracts were written it was not anticipated that they would be the ones that would make such innovative contributions. It is in this fact that I have subsequently thought myself to have been disadvantaged both as regards recognition and reward, and in part is the reason for this article.

The image proof was accomplished in 1989 and reflected the best interests of the digital technological world developments in; North America, the Eastern European block, Russia, the Middle East and Pacific Rim countries.

The technological leap into low-energy dissipation, narrow bandwidth and spread-spectrum digital modulation of video signals has brought about many design changes to HDTV specifications. These include changes to the; system transmission channel, cable and connector systems, peripheral equipment and satellite and terrestrial senders. One specific example of this is that the new equipment incorporates new lower-powered miniaturised broadband satellite and terrestrial klystrons which reduces power requirements, hence running costs.

After 1989 an agreement was made between many industrial countries to adopt digital television. It was aimed at helping ensure reliable compatibility of equipment, signals and processing from camera signal to final display screen. It had the added benefit of producing savings in spectrum video bandwidth, video data rate and radiation power while maintaining transmission quality and resilience.

The video motion detection method led to my Patent GB 2 265 784 B titled "Vision motion classification and display" with a 'spin off' of visual direction display techniques as now used in the field of civil aviation control.

The digital TV set of the future might use all organic or polymer plastic electronics in pursuit of cooler running, lower-energy consumption and lower weight equipment. An additional benefit of which may develop simpler recyclable disposal of old sets. As yet, however, logic switches capable of operating at the

requisite frequencies have yet to be developed. Looking still further ahead perhaps the most advanced product research development is HD–3D since the current best high definition digital resolution and image stability has already opened the way to domestic television viewing in wonderful ….. three dimensions.

Comments on obtaining Chartered Engineer Status

Carl Butler

I read with interest Samantha's article in the last newsletter regarding the route for engineers to become chartered through the institute. I graduated myself from the University of Kent in the summer of 2005 with a master's degree in Physics but never considered what career path I might take until I started to receive offers of employment.

I immediately started working for an engineering consultancy within their Highways and Transportation business, and in particular, Intelligent Transport Systems. I had never anticipated my career would be in this field, but having learned skills as a Physics graduate I thought that it would be a chance to develop my skills further and apply them to projects which are very much in the public domain. It was during the interview process for this position that I first heard of the term, "Chartered Engineer".

At first, I was under the impression I would have to become a member of a different institution, as I did not know the IOP offered this career path. Having since now found out that the IOP does offer this career path I find myself in familiar surroundings since I have been a member in one shape or form since my early undergraduate days. I did not find out until at least 18 months into my employment that this was the case, and I will be honest and say that fellow colleagues who are also Physics graduates seem surprised when I tell them that the IOP does support this career path. This might account for some of the responses in the survey reported in the last newsletter.

I have found some advantages in applying through my home institution which may not be all that obvious to other engineers out there:

- My degree is accredited by the Institute of Physics which is a requirement by the Engineering Council of the UK (ECUK);
- There is online support in the form of CPD and mentoring which has been particularly useful; and;
- The training scheme I am enrolled on with my employer is accredited with the Institute of Physics which makes application much simpler.

The accreditation of the training scheme is something I was personally involved in as I was the only Physics graduate enrolled on the training scheme at the time. I would strongly recommend any engineers out there on similar company training schemes to speak to their scheme co-ordinator about getting IOP accreditation as it makes the process of application much simpler.

Having now amassed four years of engineering experience, I am shortly going to be submitting my own application for Chartered Engineer status through the Institute of Physics. At the same time, I am hoping to ensure other colleagues, and fellow engineers, do not slip through the net and believe they must join a specialist engineering institution to attain chartered engineer status. I can be contacted via : karl.butler@hotmail.co.uk

Visit to MINI plant on Friday 29th May

John Battye

It was on one of those few nice few sunny days we have had this year. Our guide was one of the companies 'old timers' now retired but with a nice little part time job showing visitors around the plant that has been much of his life. Needless to say he was not only well informed of what is currently going on but also of the plant's long history. It was originally built by Morris Motors, of the 'Bull Nose Morris' fame, and where they subsequently made such famous cars as the Morris Minor and Morris Cowley. Cowley is the area on the south side of Oxford where the plant is located. What is there today is only on about half the area even I recall seeing only a few decades ago. The remainder having been sold off for modern 'clean' 'industries' like, a post office letter distribution centre (about to be relocated 30 miles south to Swindon), baby care nurseries, a motel, …. etc. I guess you've got the picture. In latter years the motor plant had many different owners as, like soldiers standing in line to fight side by side the different UK companies packed ever closer together until, like desperate, over congested, troops they collapsed. Forgive me if I forget such little independents as Morgan. The last buy out of the Cowley plant was by the German manufacturer BMW from the UK's Rover. Since then the Cowley plant has been the sole manufacture, worldwide, of the MINI.

I refer of course to the new MINI, somewhat larger than the old style ones as used, for example in the film, 'The Italian Job', staring Michael Cane. However for those still nostalgic for the old look they do have a little museum of various earlier models for the enthusiast's perusal.

On a site of 120 acres the new plant may be smaller that the old one, I guess about half the size, but it is a wonder of automation, planning and organisation. It is also remarkably clean and clearly made with employee safety and general

health in mind. Large parts of the initial manufacture at Cowley, welding etc, are done entirely by robots in well fenced areas. Installations requiring heavy lifts, e.g. of engines, are also totally automated and where lighter parts are to be fitted by hand the whole car is automatically rotated as most appropriate to facilitate the workers comfort, who in many cases hardly have to even bend. In spite of this do not get the idea that the lessons portrayed in Charlie Chaplain's famous film 'Modern Times' have not been learnt. The semi-skilled workers involved in the assembly do a moderate amount of walking around to pick up light components and fit them in place to help maintain their personal activity and interest. In all this the quality control is equally impressive with extensive automated checking of spot welds, by such as ultrasonic means facilitated by robotic arm pinpoint sensor positioning, and laser beams flashing to check, with sub-millimetre accuracy, such as chassis sub assembly dimensions and alignments after welding. The whole production process is clearly the result of great design engineering, great production engineering and considerable investment in capital equipment.

So where has all this come from? Well, both the design engineering and production engineering are done in Munich and the investment is of course from the parent company BMW, which is also based in Germany. One might think the plant is at least giving employment to British workers but apparently that is only partly true. Even today in these days of recession and weaker pound sterling apparently forty percent of the workforce on the factory floor is from Eastern Europe. When viewed like this one begins to realise it is only a quirk of history that the MINI is made on British soil at all. Basically, most of the money is actually being spent and profits repatriated to Germany, even more so when one realises that, for example, the vast number of expensive robots are also built by the German company Kuka. What is more this recirculation of the money is ever increasing. For example one part of the plant recently upgraded with more advanced robots now employs a mere 40 semi-skilled people on the floor when until not so long ago it employed 250. So much for British industry and its wealth producing capability for Britain.

One thing that I found surprising was that BMW only start building a MINI when they have a firm customer order. They don't keep a stock of partly made vehicles awaiting finalisation when, for example, they know the colour the customer would like. Not only would this tie up capital and space, but increase handling requirements, allow unnecessary deterioration while in storage, reduce flexibility for the addition of design improvements and greatly complicating administrative costs. The approach they use allows literally millions of alternative vehicles to be 'tailor made'. Made to suit the legal peculiarities of the over 80 countries they now sell to and allow the satisfaction of customers individual preferences and whims. I thought it was bad these days going to a coffee house and being asked to choose from a long list of coffee types that I would like. Imagine what it must be like to take over seriously the much, much longer list of features that one might like ones

new car to have, e.g. body colours (two tone or not), carpet colours, wheel types, etc, etc, etc. Gone are the days when, as Mr Ford said of the Model 'T', you can have any colour you like as long as it's black. Even so, I hear some of you thinking, millions of alternatives? Well, the cars apparently have up to 82 sensors to start with. I'm sure many are essential, not optional, but apparently those that are optional are so numerous that when multiplied up with other optional features one can easily appreciate how the number of alternatives can escalate into the millions.

Achieving all this of course requires that fantastic organisation I referred to earlier. The Oxford plant is actually one of three in the 'Production Triangle' contributing to the car's final assembly in Oxford. The other plants of the triangle are located in Swindon and Hams Hall, so that there is a constant flow of trucks carrying parts from these other plants to Oxford. Co-ordination, heavily computerised of course, is so good that, for example, when a particular car temporarily stops on the assembly line next to the person fitting the carpets, the next carpet in the box from Swindon, is exactly the one designated for that particular vehicle.

The Oxford plant has been steadily trying to shorten its overall supply lines and now gets 40% of its materials from within the UK. However, this does not include the steel which is sourced from Germany or Holland, the latter presumably being the remnant of the Anglo Dutch 'Corus', now owned by the Indian company 'Tata'. Is there any steel industry now left in Britain?

Whereas in the earlier days of motor manufacturing, companies made up general wiring looms of which, depending on the options chosen by a customer, only part would usually be used on any particular vehicle, the looms now made for the MINI are all individually tailored to the customer particular order. It was interesting to hear of the subtle differences required by cars sold to different countries, e.g. cars going to the US need reflectors on the side of mud guards, those for the UK do not. A small difference it may be but they have to comply, and such details all contribute to those millions of variants the factory has to cater for. What may seem surprising, when looking on British roads, is that 40% of their production goes on making convertibles. As a safety feature these 'soft tops' have a sturdy role bar that automatically deploys by popping up to protect the occupants should the car start to invert in an accident. Another interesting feature is that in the interests of the customer's economy, the car's engine automatically shuts off to save fuel when the car is stopped at such as traffic lights. I notice that Audi have just started advertising this feature on one of their models. Would this feature be to help compete against such as Toyota's innately more efficient, in heavy traffic, petrol/electric model, Prius?

Free Chartered Status Training Event Dates

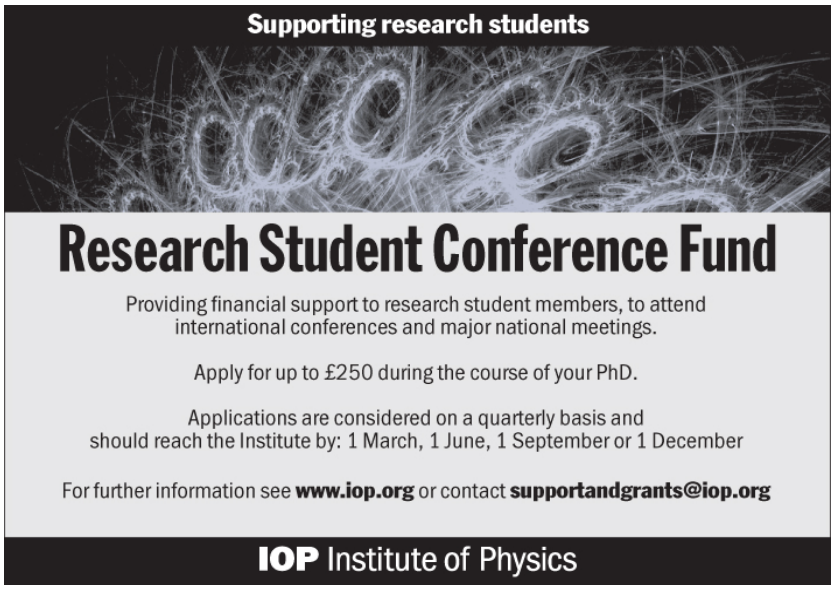
For those of you interested the following are still to take place.

Date	City	Venue
24 Sept	Manchester	Victoria and Albert Manchester Marriott Hotel, Water Street, Manchester M3 4JQ
29 Oct	London	76 Portland Place, London W1B 1NT

Grants

For those of limited financial means we offer a few travel grants for those wishing to attend visits to places of scientific and engineering interest that we organise. Please e-mail our secretary, Samantha Davidson (s.davidson@physics.org) both if you wish to apply for a place on a visit and, making your case, if you wish to request assistance with travel costs.

Bursaries



Thoughts, comments and ideas please

We, your committee, are very keen to hear of any thoughts, comments or ideas you may have. If you have any please e-mail them to our secretary, Samantha Davidson (s.davidson@physics.org).

As I trust you know by now we are always looking for articles. I know that for many in industry the necessary commitment to the fortunes of their employer --- few of which see their interests as having any direct synergy with those of the IOP --- makes it difficult, to participate in the activities of the Group. However, I hope with the diverse examples of the articles in this and previous Newsletters some of you are stimulated to make submissions for EPG Newsletters of the future. The Newsletters, and to a sizable extent the group, really do depend largely on the efforts you put in yourselves.

If any of you wish to submit an article for publication in this Newsletter please sent it me John Battye *(john.battye@physics.org).*

Events of interest

- ***Friday 2nd October*** 2009: 2.00 pm to 3.30 pm: **Annual General Meeting** in the Glazebrook Room, IOP, 76 Portland Place, London, W1B 1NT

For these and other events see our website at: http://eng.iop.org

Election for new Chair, Secretary and Ordinary Comittee Memebers of the Engineering Physics Group

As IOP rules dictate the officers of your EPG committee, i.e. the Chair, Hon. Secretary and Hon. Treasurer must hold office for no longer than three years at a time and not more than nine years in total. Ordinary members of the committee can stand for six years but need to be re-elected after three years in office. As a consequence of this a new Chair and new Hon. Secretary have to be elected now and our Ordinary Committee member Vicky Weiss who has stood for three years has to put herself up for re-election in order to continue in her present role, if she doesn't seek a different one.

Will those wishing to stand for; Chair or Hon. Secretary please supply our current Hon. Sec. Samantha Davidson (s.davidson@physics.org) (Dr Samantha Davidson, Ultra Electronics PMES, Armitage Road, Rugeley, Staffordshire WS12 1DR) notification of their wish with a brief statement (no more than three quarters of a page of A4, font size 12 please) to support their application.

Will those wishing to stand as an Ordinary Member of the committee also please put their names forward to Samantha with a brief statement in support of their application? We have a few vacancies. (Of the present committee only Vicky needs to do this at this time, the others still have 'time to run'.) All nominations need to be with Samantha by Monday 11th September.

All members wishing to stand for election must be proposed and seconded by another member of the group who is also a corporate member of the IOP. Please list the names of your supporters and their IOP membership number on your nomination.

Where there is more than one candidate for any position appropriate details of the applicants for that position will be sent out to you all with requests for your votes to be with Samantha by Friday 25th September.

The ballot is not secret but the information will be kept confidential until the group's AGM on Friday 2nd October whence the results will be announced and vacant positions filled.

Your Engineering Physics Group Committee 2008/09

Eur Ing Dr John Battye (Chair)	john.battye@physics.org
Dr Samantha Davidson (Hon. Secretary)	s.davidson@physics.org
Dr Paul Bartlett (Hon. Treasurer)	paul.bartlett@ucl.ac.uk
Dr Victoria Weiss	VLWEISE@qinetiq.com
Dr Mohammad Sanduk	m_sanduk@physics.org
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