

Sharp-SID Award 2007

The Sharp-SID Award 2007, was won by Dr Adrian Cable of Light Blue Optics. The Award, which was inaugurated this year, is awarded to someone who, as a graduate student, has made a recent significant contribution to the field of information display. Dr Cable, completed his PhD under Tim Wilkinson at the University of Cambridge and his work has resulted in an algorithm, which allows binary phase holograms to be generated in real time.



*Sharp-SID Award Presentation
From L to R, Dr Richard Harding, Chapter Chair, Dr Steve Bold, Managing Director of Sharp Laboratories of Europe and Dr Adrian Cable, Light Blue Optics*

The Award was presented to Dr Cable by Dr Steve Bold, Managing Director of Sharp Laboratories of Oxford, at the technical meeting following the AGM.

**Two-day Technical meeting
Knebworth, Stevenage, 16-17 April 2008**
Details available later (www.sid.org/chapters/uki.html)

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Ben Sturgeon Award 2007

The Ben Sturgeon Award for 2007 was awarded to Dr Carl Brown of the School of Biomedical and Natural Sciences at Nottingham Trent University. This award was made in recognition of his work on the alignment of liquid crystal materials.



Presentation of the Ben Sturgeon Award 2007 to Dr Carl Brown (right) by Richard Harding

Carl received the award from the Chapter Chairman, Richard Harding during the technical meeting at Bletchley. At the meeting, Carl gave a very interesting overview of bistable LCD alignment including both his latest and earlier work, much of which was carried out at DERA (now QinetiQ) before it was spun-off to create ZBD Displays.



SOCIETY FOR INFORMATION DISPLAY

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NEWSLETTER

December 2007

Chairman's Report

Richard Harding

I hope you enjoy the latest SID UK & Ireland Chapter Newsletter. It is almost six months since the AGM meeting where I was elected your Chairman and a good time to reflect on our activities.

I remember the previous Chairman's report written by Grant Bourhill, with a strong emphasis on the rich use of displays in our daily life. Looking around, I see this trend is still very much continuing and further improvements are continually being sought. As such, the SID community should be well placed for many years to come.

Turning specifically to the UK & Ireland Chapter, we have spent some time looking at what we offer and made some changes – key parts of which are summarised below. We also considered how to increase our profile further. In part, this concentrates on actively informing and involving students, and targeting 'new' industrial sectors – related to displays, but traditionally under-represented at SID meetings. Free membership is now being offered to full-time students (more details at <http://www.sid.org/chapters/uki.html>) and we have set-up the 'Sharp-SID Best Student Award' rewarding the best display-related paper published by a student with a prize of £500, thanks to Sharp Oxford (see Page 4).

Looking back at our activities, we started our technical meeting programme immediately following the AGM, held at Sharp Oxford in April. The meeting was on 'Advances in Displays for TV' and covered not only the latest improvements in competing display technologies but also the challenges introduced changing from analogue to digital broadcasting and making a full-HD 1080p display look good with only a conventional signal. A report on this meeting appears on Page 2 of this Newsletter.

More recently (17-18th Sept) we held a trial two-day meeting on 'Organic Electronics'. For this event we specifically targeted student participation. The seminar had a mixture of key-note invited speakers and student oral contributions along with a poster session – the best poster being awarded a prize of £500 thanks to Merck.

Altogether this was a great success, the meeting was relaxed and informative, the students made a significant contribution and the event was well attended. Following this success we plan to run this event again.

The latest meeting 'Successful Displays by Design' was held at Bletchley on 17th October and was held jointly with UKDL. In addition to an interesting line-up of speakers, detailing the latest efforts to

improve display usability, the Ben Sturgeon Award 2007 (<http://www.sid.org/chapters/uki/award.html>) was also presented at this meeting to Dr Carl Brown (Nottingham Trent University), acknowledging his work on alignment of liquid-crystal materials. Carl gave a very interesting overview of bistable LCD alignment including both his latest and earlier work, much of which was carried out at DERA (now QinetiQ) before it was spun-off to create ZBD Displays.

I hope you could attend at least some of our meetings and enjoyed what we had to offer. As always more meetings will be planned and new topics are continually being sought. Please feel free to send me any suggestions you have.



Richard Harding

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Call for nominations for
Ben Sturgeon Award 2008
by 31 January 2008 (www.sid.org/chapters/uki.html)

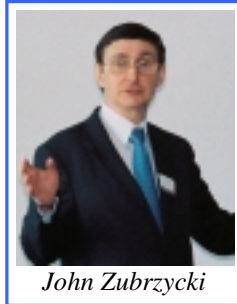
ADVANCES IN DISPLAYS FOR TV

One-day meeting at Sharp Laboratories of Europe, Oxford, 25 April 2007

Report by Nathan Smith

Following on from the Chapter AGM, the technical meeting opened with a welcome and introduction to Sharp Laboratories of Europe (SLE) by Dr Steve Bold, Managing Director of SLE. The first technical paper, 'Change your tune(r) – the onset of digital TV, was presented by Grant Bourhill, SLE. He gave a broad overview of digital TV. Technical performance comparisons between the leading flat-panel display technologies were discussed. Market forecasts for flat panel display technologies in terms of pricing and volumes were also shown with LCD retaining a majority of the market share. It was cited that LC TV hardware performance is ahead of content and many people are using high-definition (HD) televisions with low-resolution signals. Reducing fabrication costs while increasing performance was discussed - a theme repeated in many of the subsequent talks.

This was followed by, 'Televisions in the flat-panel display environment', given by John Zubrzycki, BBC Research. This was a thought-provoking talk for flat-panel manufacturers from the perspective of the people who make much of the TV content. Subjective testing by the BBC cited that there was no need for full HD resolution (1920x1080) until a screen is >57 inches (view distance 2.7m – see BBC White Paper 092). The "Grade 1 CRT monitor" remains the reference viewing device used by the BBC for television production and thus for optimal home viewing it is imperative that all televisions (LCD, PDP, CRT etc.) have a similar optical characteristics to the Grade 1 monitor. Of particular importance for LCD was the requirement for better luminance (gamma curve) and colour gamut (ITU-R Rec. BT. 709) matches with the Grade 1 monitor. The implementation of over-scanning techniques must also be carefully considered. Coverage of HD signals and the impact of analogue switch-off were also discussed.



John Zubrzycki

The final paper of the morning was given by the winner of the Sharp-SID Best Student Award, Adrian Cable, of the University of Cambridge/Light Blue Optics. The subject was 'Real-time two- and three-dimensional holographic video projection using one-step phase retrieval approach'. An overview of video projection using computer-generated holograms from a spatial light modulator (SLM) was presented. In order to project images at a video rate, judicious use of the computational algorithms must be employed in order to maximise image quality. The advantages over conventional projection systems were discussed in terms of miniaturisation, better light efficiency and cost down (fewer components, fewer moving parts, high SLM fault tolerance).

The afternoon session was opened by Peter Raynes, University of Oxford. In his paper, 'Liquid Crystal TVs – from dream to reality', he gave a historical review of the major technical problems faced by the liquid-crystal display industry over the last 30 years and the subsequent solutions that have enabled the high-quality LC TV to become a standard consumer product. From the mid to late 1970s, development of cyanobiphenyls (room temperature LC material) and the 90 twisted nematic mode enabled low-information content (calculators and watches) LCDs to become common place. The early 1980s saw the invention of the TFT switch and the supertwisted nematic mode that enabled high information content displays. By the mid to late 1990s, LC TV was made possible owing to "intrinsic black" LC modes (crossed polarisers govern black state) for enabling high-contrast displays. In addition, new optical-compensation films have enabled good viewing angles and electrical over-driving schemes have largely solved the problem of response speed.

'The bright future of PDP', was discussed by Harm Tolner, South East University, Nanjing. He discussed the battle between LCD and PDP at length in terms of performance metrics, marketing strategies, consumer price and production cost. In terms of performance metrics, it was cited that although HD LCD may look better in the showroom, PDP looks better at home owing to a darker black level and less motion blur. It was also cited that new PDPs have fewer burn-in issues than a conventional CRT and power consumption per square metre is only 20% more than LCDs. It was argued that production costs for PDPs would fall at a faster rate than for LCDs owing to the cost of the raw manufacturing materials.

The next talk on, 'Multi-user 3D displays' was given by Ian Sexton, De Montford University, in place of Phil Surman. The talk gave an interesting overview of multi-user 3D projection systems – able to give freedom of movement without any headgear – through different projects. The first of these systems, based on a LCD with behind arrays of 'clever' optics steering the light to viewers' eyes, used LED arrays and suffered from dimness, crosstalk and colour variation. The system evolved to RGB laser combined with a holographic projector (MUTED project) and a future project plans to suppress the LCD by using MEMS scanning system instead (HELIUM 3D project).

The second day included a description of an art installation in Germany using large digital displays, which clearly showed the ability of such displays to catch peoples' attention and a talk from an architect discussing the use of displays in buildings. Other talks described experiences of installing different display systems, both in retail environments, on road sides and for public information. The details were certainly of use to anyone considering similar schemes. Successful systems described were those installed at the terminal stations in London, with large area LED screens now expanded to 17 stations nationwide.

The captive audience of those waiting for trains is attractive to advertisers and it has turned out to be a very efficient system to run. Other speakers described the 650 displays that will be in the new Terminal 5 at Heathrow and the successful trial of outdoor displays that the BBC has set up for live events, including particularly sport. Cinema is clearly to be affected by digital displays, but a talk from Carlton contained some warnings about the costs of setting displays in this context, since many cinemas do not have large budgets for the set up costs. Clearly there are advantages with distribution of digital cinema over 35mm film, but there will be a legacy for some time of cinemas who do not convert. The advertising revenue to cinemas is relatively low in comparison to other media, but it may be possible to use digital displays in other ways to gain revenue.

This was an interesting conference and I'm sure will have been of value to those directly involved or those considering the use of digital displays. It will be interesting to attend the next Big Displays conference to hear about the ways in which the rapidly changing market has developed.



Peter Raynes



Harm Tolner

Cont on Page 3

REVIEW OF THE BIG DISPLAYS CONFERENCE

London, 22 – 23 March 2007

Report by Sally Day

The Big Displays conference was held in London on the 22nd and 23rd of March. It was well attended by delegates from a variety of different industries, particularly those interested in the commercial aspects of digital signage networks. It gave an interesting perspective for me, coming from research on displays, on the commercial drivers for large-area displays. The first day was more focussed on the technology of large-area displays and the future markets for such displays. The second day was more of a reality check, with speakers describing their experiences of using, installing and selling the 'real estate' of, for example, advertising on large displays.

The final presentation of the day was on 'FEDs for large TV displays' presented by Bill Taylor, MIMIV. It was cited that Field Emission Displays (FEDs) have performance advantages over both PDPs and LCDs with regard to brightness and low power consumption. The emitter technologies, of which there are broadly five, govern the performance of an FED. A review of these different emitter technologies was presented and the engineering issues of scaling up a laboratory result to a commercially-viable product were discussed.

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Advances in displays for TV (continued)

Jonathan Halls of CDT then gave a presentation on, 'Advances in polymer OLED displays'. He reported that recent technical improvements have led to a better colour gamut and a significant increase in device lifetime for polymer OLEDs. Advances in the printing industry have enabled both high and low information content displays to be realised. It was argued that simplicity in OLED device structure (fewer components) compared to an LCD would help keep the cost down. A new addressing scheme (Total Matrix Addressing) would also help keeping the cost down as improving device lifetime.



Jonathan Halls

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Bill Taylor