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# Newsletter

The Society of Light and Lighting  
Part of the Chartered Institution of Building Services Engineers



- **Light for Life: the new Masterclasses**
- **Mark Major on the Speirs lecture and the legacy**





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2013 was apparently the International Year of Quinoa, a fact that I suspect passed most people by. I wonder if that means that more people now know what it is and, even more crucially, how to pronounce it.

It was announced in December 2013 that the UN had decided that it was now our turn and that 2015 was to be the International Year of Light and Light-based Technologies. No one could accuse anyone of making a massive publicity splash out of this. In the early months of this year whenever this news cropped up in conversation with a member of the lighting fraternity, it was invariably greeted with an expression of surprise and puzzlement.

This lack of awareness was largely due to the fact that the whole concept had largely developed in scientific soil, under the auspices of assorted learned physics and optical bodies. It was all more about nanophotonics and quantum optics than it was about how we light the built environment and all the complexities that involves.

There was then a degree of bafflement on the part of professional institutions and others concerned to redress this oversight. Whose door to knock on, especially when the UK government has not signed up to the enterprise? What was involved? What did it mean to sign up as a sponsor, potentially a costly exercise?

Over recent months the fog has largely cleared and lighting the built environment is now firmly established as an important area on the International Year of Light website home page. The SLL has signed up as a Gold Associate – you may have noted the logo on the front cover of the Newsletter which will remain throughout the year.



In the January/February issue we will look more closely at what the SLL's involvement will entail and at the IYL's programme of events next year.

So now acts have been got together and the momentum has grown, it's down to the lighting industry and profession to use this coming year for all its worth to educate and inform fellow design professionals, related scientific disciplines and the public.

After all, it is a measure of the lack of awareness about what is a rather obvious aspect of lighting that led to it not being considered for the agenda in the first place.

It may have been a slow start but let's hope everyone grasps the opportunity by the lapels and makes damn sure everyone is considerably more enlightened about lighting than they probably are about quinoa (keen-wah, for anyone who was wondering).

**Jill Entwistle**  
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LETTERS...**LETTERS**...LETTERS..LETTERS..LETTERS...LETTERS...LETTERS

We are indeed living in interesting times in the lighting field – energy, new sources and a myriad new restrictions and so on.

I agree with Iain Macrae (Qualified success, p8 NL July/August) that lighting designers should work to get chartered status. I think about that from time to time as I watch the work to reach that goal.

My only thought is that it would be perhaps interesting to try to get a two-tiered certification – a basic level for, say, a practitioner, and then a professional level that would be reserved for

those who have made a contribution to the profession.

These are just thoughts. Some distinction should be considered, however, for those who have advanced the art versus those who just follow the guides. The certification of all is a good idea. So since it is being brought forth now, this distinction suggestion of mine might be worth considering.

**Howard M Brandston, FIES, Hon FCIBSE, Hon FSLL, FIALD, LC**

It's November and this can only mean one thing...the finals of the SLL Young Lighter of the Year 2014 will be held from midday Thursday 20 November at LuxLive, ExCel London. We're very excited for our four finalists – Janna Aronson (Lichtkompetenz), James Duff (Arup), Katerina Konsta (Atkins Global) and Veronika Labancova (Isometrix) – who will present their papers in the EcoLight Arena near to the SLL stand (D60) with the winner presented the same evening at the Lux Awards.

The society will be at LuxLive on 19 and 20 November and we'd love you to come along and say hello. We'll be able to update you on our approach to the Unesco International Year of Light 2015 and also talk you through any membership or upgrading queries you may have.

The Mini-Masterclasses will take place at LuxLive from 10:30am on Wednesday 19 November in Tech Theatre One with our Sponsors in Partnership – Helvar, Philips, Thorn and Trilux – delivering a taster of the new series we will be taking around the UK (see p7 for details).

The new Masterclass series started recently in Birmingham and over the summer we have fully reviewed, analysed and refined the series. We will host a Lighters' Question Time with luminaries from the society, speakers and guest speaker, and we encourage you to submit any questions prior to the events as well as at the events themselves. We have responded to the feedback from last year's series and the theme of Light and Wellbeing; Light for Life will deliver presentations that all lighters should not miss.

At LuxLive we will also launch the Jean Heap Bursary. Jean was a past president of the SLL and passed away seven years ago. She was passionate about lighting education and research, and the bursary is in her honour.

It is proposed that the bursary be awarded each year to an individual to support them in carrying out a specific piece of lighting study or research for the benefit of the industry and of SLL members. The outcome of this research should be presented in a paper at the end of the funding period.

In the coming months the society will be publishing the rewrites of LG8: Museums and Galleries; LG10: Daylight Design, and LG12: Emergency Lighting. These will be available to you all through the CIBSE Knowledge Portal. In early 2015 we expect to publish a new guide, LG14: Transportation, as well as the rewrite of LG7: Office Lighting.



The society has confirmed its support to Unesco for the International Year of Light 2015. We will be a Gold Associate sponsor for the IYL, working with both the European Physical Society and the Institute of Physics (UK Steering Committee). It is going to be a big year for all of us and an opportunity for us to promote you and the lighting industry in all its facets. Whether a researcher, designer, manufacturer, artist, engineer or healthcare professional working in light, this is your year.

We welcome on board our new Sustaining Member, Artech Lighting, as well as new communications and marketing committee members, Rob Anderson and Wiebke Friedewald. Victoria Jerram has recently joined our education and membership committee.

We have a brief news report from the Artificial Light at Night (ALAN) conference (see p4), an event that the society was very happy to support. It was truly a wide-ranging and diverse conference with the common theme of light and its effects at night. It was also an eye-opener to the lighting research that is going on in the background that may not immediately seem relevant to the lighting design profession. This work will affect us all in one way or another at some time in the future.

Finally, we congratulate Hugh Ogus MBE FSLL FCIBSE for receiving the Gold Award from CIBSE. The Gold Award is rarely given and it is even rarer for it to be given to a lighter. Hugh has worked tirelessly for the lighting profession and lighting education, and was made an honorary fellow of the society in May this year. We can't think of a better recipient.

**Brendan Keely, MSLL**  
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◀ In this scenario the lighting system receives both its power and a unique data location from an internet cable. When the luminaires are connected to relevant sensors the lighting system is then able to capture key information about each workspace. Thus these systems are able to take advantage of the fact that lighting is already installed throughout a building to supply location-based data to the facilities management team.

In this way the lighting system becomes the backbone of a building-wide information pathway that continually monitors key metrics to underpin improvements in energy and operational efficiency.

These metrics can include comfort parameters such as light levels, temperature and humidity within each space or zone, as well as providing improved insights into the real occupancy and usage patterns of the building. The latter, in turn, feed into improved use of space, optimised cleaning schedules and fine-tuning of flexible workspace policies. For example, if a particular floor is not used on a Friday afternoon the facilities manager can adjust temperature, lighting and cleaning schedules accordingly.

These network connections also enable mobile devices to be used as communications portals for facilities managers and their internal customers to interact with the lighting.

**Indoor positioning**

The same principle can be applied very effectively in the retail sector, using the lighting as a platform for new indoor positioning technologies. For instance, when combined with a mobile shopping app on customers' mobile devices such a system can be used to identify each shopper's location in the store and provide product information accordingly. The shopper can also proactively use the system to get directions to a particular product in the store.

Similarly, an indoor positioning system can be used to send packing and restocking orders directly to staff in the warehouse or store, making order picking and shelf stacking more accurate and straightforward. Store managers can also assign tasks and adjust employee activity more efficiently by using this real-time information.



Lighting can be used as an alarm clock and a security system, and interact with other devices, such as a doorbell or a phone

**Given that lighting is already installed in all of our buildings and cities it makes perfect sense to exploit its ubiquity to gather location-based data that adds real value to the operation of our built assets and infrastructure**

The major challenge here is how to distribute responsive devices easily and affordably throughout the site. However, the obvious answer is to take advantage of the fact that the lighting system is already present and fit intelligent LED luminaires with responsive devices such as locator beacons, sensors and transmitters. In this way the lighting system goes beyond simply illuminating spaces to serve as a highway for information and data.

**Connected cities**

It is already well-established that LED lighting can deliver significant benefits for the outdoor lighting in our cities. When combined with intelligent controls it can deliver energy savings of around 80 per cent over traditional light sources, while the white light enhances visibility and the sense of safety. The next stage in the evolution of city lighting is to exploit this functionality to create connected lighting for cities.

The concept of connected lighting for cities is to use new web-based street lighting management systems to adapt light levels based on local or central information, such as traffic or weather data. Cities can roll out these intelligent systems very quickly, using LED outdoor fixtures with built-in mobile connectivity to the central management system, eliminating the need to deploy local radio frequency networks and reducing installation costs.

Once such a fixture is plugged in, a light point can automatically appear on the city's asset map, at the right location and with its main technical parameters already integrated into the system. The lighting can then be controlled remotely – individually or as a group – in response to the data that has been collected.

As well as monitoring current lighting status, the central management software can also provide auto-notifications of faults and accurate information on the energy consumption of individual street lights. In parallel, asset management systems can easily access information about the whole street lighting network and receive real-time updates about lighting maintenance requirements.

Given that lighting is already installed in all of our buildings and cities it makes perfect sense to exploit its ubiquity to gather location-based data that adds real value to the operation of our built assets and infrastructure. Technological developments, design possibilities and the ability to connect billions of things are allowing light to be integrated into our lives in totally new ways. The future is limited only by our imagination – all we have to do is make the connection.

**Darren Smith is senior custom product designer at Philips Lighting**

# Light for life: Masterclasses 2014-15

HELVAR (Speaker: Dan Wills MSL)

**Paradigm Shift in Lighting Control**

The role of lighting controls in our daily lives

- A holistic approach to the entire light system
- Importance of distributed intelligence (smart luminaires)
- Convergence of control philosophies

The importance of user interfaces

- Tailored to individual user requirements enhancing ease of operation
- Sea change from traditional buttons and switches to soft applications
- Integration with other systems, maximising the user experience

Shift towards intelligent sensor networks

- Importance of understanding what is really happening in our light environment
- Innovation of smart luminaires driven by universal adoption of solid-state lighting
- Human benefits of smart lighting

Standardisation and metrics

- Maximising the adoption of new technologies
- Link between different control philosophies and scientific studies
- Importance of viable economies of scale for commercial success

PHILIPS (Speaker: Darren Smith)

**Connecting the World of Light**

Taking digital technology to the next level. Moving away from the traditional performance discussions which only scratch the surface of their capability, and moving into the human control and interaction possibilities.

- Connectivity within the home through wireless communication
- Connectivity in the office, with route finding, data pathways and information gathering
- Connectivity in retail to enhance the shopping experience and to complement online activity
- Connectivity outdoors, bringing cities to life through interaction

TRILUX (Speaker: Helen Loomes MSL)

Human centric lighting in practice: tune into your biological rhythms.

- Focusing on human biological responses to lighting
- Recapping the biology of light and its effect on our circadian rhythms, human wellbeing and health
- Looking at case studies on lighting in a successful academy school and a university which is still in construction
- Looking at research to improve the environment for elderly people including a case study on the new dementia ward at Ipswich Hospital
- How human centric lighting can be incorporated into any lighting design for spaces in which people will spend a relatively large amount of time, and whether this will be the future focus of our living and working spaces



Speakers, clockwise from top left: Dan Wills, Helen Loomes, Kevin Stubbs, Darren Smith

THORN (Speaker: Kevin Stubbs MSL)

**Tune up your environment**

- Some elements of lighting that can affect us
- Factors that may be considered when trying to improve lighting
- An outline of what simple technology is available to help us (tunable white luminaires)
- An example of a solution where some of these elements have been used to uplift an installation

**Dates and venues**

**23 October 2014:**  
Birmingham  
Library of Birmingham,  
Centenary Square, B1 2ND

**26 March 2015:**  
Edinburgh  
Edinburgh Castle,  
Castlehill, EH1 2NG

**27 November 2014:**  
Dublin  
Guinness Storehouse  
St James's Gate, Dublin 8

**30 April 2015:**  
Bristol  
Watershed  
1 Canon's Rd, BS1 5TX

**29 January 2015:**  
Newcastle upon Tyne  
St James's Park, NE1 4ST

**14 May 2015:**  
London  
Royal Society of Arts  
8 John Adam St, WC2N 6EZ

**26 February 2015:**  
Leeds  
Leeds City Museum,  
Millennium Square, LS2 8BH

**Book at [www.sll.org.uk](http://www.sll.org.uk).  
More details from [sll@cibse.org](mailto:sll@cibse.org)**

# Passing the torch

Mark Major talks to Andrew Brister about the inaugural Jonathan Speirs Memorial Lecture and the legacy of his long-time partner



## How did the Jonathan Speirs Memorial Lecture come about?

I was approached by CIBSE and the Society of Light and Lighting, and asked my opinion about the plans to set up a memorial lecture in Jonathan's name. I thought it was a great idea. And when I heard that the plan was for it to be based in Scotland I thought it was an even better idea. It's great that the lighting community has recognised his work in the same way that the architectural profession has; he was honoured by the Royal Incorporation of Architects in Scotland (RIAS) with its Lifetime Achievement Award – the highest accolade within Scottish architecture.

## What was the focus of the lecture?

The theme was Light + Dark = Architecture. I like that title because I think it clearly and accurately suggests that the creation and revelation of architecture is not just about light, but it's also about darkness and somewhere in between – it's those sorts of conversation that Jonathan and I had over many, many years. Quite often less can be more, and simpler can be better, when it comes to the world of lighting design. When you look at the most beautifully lit projects, and the most awe-inspiring buildings, often the idea behind the lighting is quite simple.

I wanted to highlight Jonathan's early years in lighting design, both at LDP where we both worked in Edinburgh in the mid-1980s, and the early years of Speirs + Major. I also wanted to use projects as well as other images – his, mine and others from the practice – to illustrate our philosophy and approach.

One of the biggest challenges with the lecture was trying to distill everything down to make that philosophy as clear and simple as possible. It was about light, darkness, change, the passage of time, the movement of light, the connection between natural and artificial light, how that changes over time, often working in harmony.

In the second part of the lecture I wanted to bring things up to date and show some of the projects the practice has completed since Jonathan's retirement in 2010. Things change of course;

**The creation and revelation of architecture is not just about light, but it's also about darkness and somewhere in between – it's those sorts of conversation that Jonathan and I had over many years**

markets change, technology changes, people change and clients change, but I think Jonathan would be proud of what's been achieved – for example, the In Lumine Tuo project in Utrecht has recently won a Radianc Award from the IALD. I think the philosophy that we established all those years ago is still guiding us today.

## How inspirational was Jonathan?

Jonathan was an enormously inspirational figure. He was a very extrovert character, with immense charisma, and the most unbelievably enthusiastic person you could ever meet. When you talk about people being either a glass half-full or half-empty person, his glass was constantly overflowing. He had an enthusiasm for light, for architecture, for life as a whole; he was one of those guys who makes people smile, laugh, enthused.

When he died, I received so many emails from all over the world, not just from his friends and contemporaries, but from young lighting designers as well, and all could remember when they met him and the conversation they had. Many remarked on how what he said had given them drive or changed their direction. It was amazing reading those emails.

## And what was it like working with him?

We did have different temperaments and we complemented each other incredibly well. We were almost inter-reliant. Although he was based in Edinburgh and I was in London, we would exchange views daily; particularly after a big meeting, we would have a chat. And later that would manifest itself when one of us would say: 'I've been thinking about what you said last week and...' We kept each other sane.

## How are things going with the Jonathan Speirs Scholarship Fund?

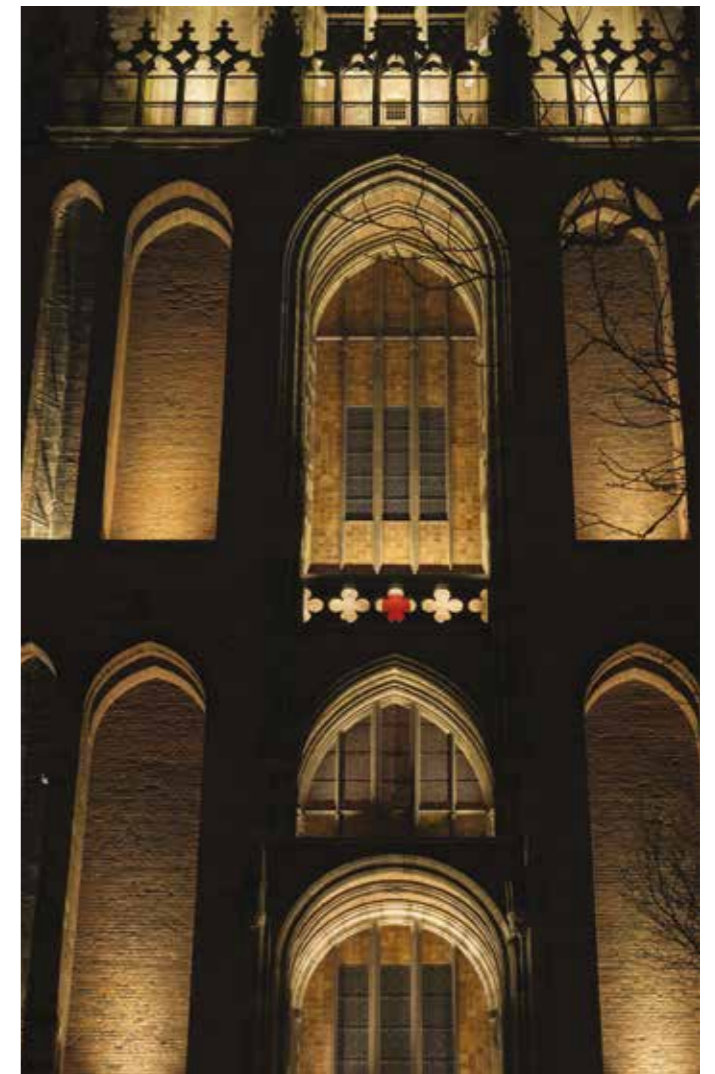
It's doing really well. Myself and my fellow trustees talked to Jonathan about the fund before he died and didn't give him a choice really. Both he and I came into lighting design from architecture. It was quite a daunting move and one or two people thought that lighting design had no future – how wrong they were.

Architecture is a highly vocational discipline, and it's a long course with huge costs and a lot of hard work and graft, so it's a big step to give all that up to take up lighting design. You have to be kind of brave or mad. I think we were a bit mad, but our enthusiasm drove us along. There's a danger now, with student fees, that people are increasingly reluctant to take that step without some kind of support, so that was the purpose of the fund – to offer support and encourage architects to make the transition to lighting design.

We've had huge support from the lighting industry, as well as



The Sheikh Zayed Grand Mosque in Abu Dhabi: award-winning interior and exterior schemes completed by Jonathan Speirs, with current co-principal Keith Bradshaw, before his retirement



Continuing the legacy: In Lumine Tuo, Utrecht, which this year brought the practice its fifth Radianc Award from the IALD, an unprecedented achievement

individuals. Alex Stewart [a Masters student from the School of Architecture at Parsons, The New School for Design, New York] was the first recipient of the £10,000 fund and we are just at the stage now where we are raising awareness among this year's students.

## What are the long-term aims of the fund?

Simply to keep it going, keep it funded. A lot of people have signed up for 10 years, so the security of the fund is assured for the next decade, which is fantastic.

## And how would you like to see the Memorial Lecture develop?

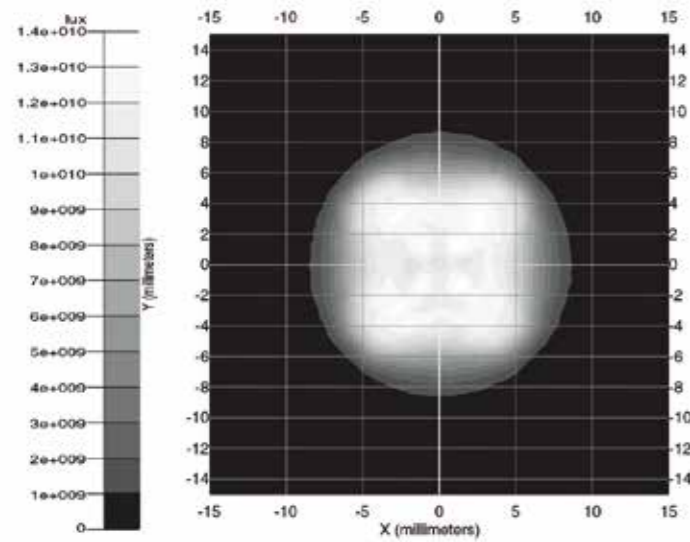
That would be up to CIBSE and the SLL, but I'd like to see it as a platform for two things. First and foremost, as a platform for lighting designers to talk about their passion for light, but also I hope that it's a platform for Scottish lighting design. Jonathan was proud to be a Scot and Scotland has an interesting history in modern lighting design, with a strong lighting community. It's great to see an annual lecture programme in Scotland because they deserve recognition for what they've achieved.

The inaugural Jonathan Speirs Memorial Lecture took place at Glasgow City Chambers on 25 September. This interview is based on a piece that first appeared in Mondo Arc magazine



# The diode is cast

Iain Carlile finds that LEDs are the dominant theme in the latest issue



The illuminance map for a discontinuous surface reflector for high-power integrated LEDs (Liu et al)

The October issue of LR&T presents a number of papers considering LEDs and LED luminaire design. Other topics include daylight systems and lighting control.

Boyce's editorial considers lighting metrics and how new technology, applications and concepts can challenge existing metrics. Following on from the recent LR&T symposium, Better Metrics for Better Lighting, he postulates that any new metric proposed needs to be simple, driven with passion and perseverance, and have a sufficient number of supporters to challenge the status quo. By changing metrics, research is most able to influence lighting practice.

Bedocs's opinion piece questions if LEDs are the correct solution to all lighting applications. Bedocs notes how many articles are published in which LED installations are compared against more traditional technologies, sometimes outdated ones, or don't consider visual comfort. He calls for more honesty in claims that LEDs are the only lighting solution.

A paper by Chang, Hong and Li proposes an LED module for the supplementary lighting of greenhouses. The module would provide different wavelengths of light according to the current solar spectral distribution and plant growth patterns. Compared to traditional plant lamps, the module's simulations show it can achieve energy savings through the variation of wavelength and intensity of light.

Liu et al present a design for a discontinuous surface reflector for use with LEDs with a square-shaped light-emitting surface, in order to project round spots of light at a relatively short distance, providing good uniformity and the removal of any central dark spots.

Also considering LED technology, Yurtseven, Onaygil and Ogus present a two-resistor model to predict the thermal behaviour of LED junction temperatures, allowing a better estimation of a luminaire's total luminous flux, and lowering costs and time required for prototyping.

Moving away from LEDs, Jiang et al present a study

investigating the relationship between the veiling luminance and unified glare rating in an interior lighting installation. A transfer function is derived providing a link between disability glare and discomfort glare.

The circadian human response to light stimuli is non-linear; many sophisticated, accurate non-linear models exist to try and predict this response, but they are not simple to apply. Bellia and Seraceni present a simple model to allow quick evaluation of the potential 'circadian effects' of different light sources.

Figueiro, Nonaka and Rea's paper investigates the effect of daylight exposure on night-time performance and subjective sleepiness. They established that prolonged absence of daylight may be associated with poor performance in workers both during the day and at night.

Considering the use of the mesopic photometry system in lighting applications, Uchida and Ohno conducted vision experiments to measure the surrounding luminance effects on the adaptation state at a peripheral task point. They found the adaptation state depends mostly on local luminance. When high luminance sources do not exist in the field of view and the luminance distribution is uniform, local luminance around the task point can be used to predict the adaptation state.

Yeh proposes an active natural light illumination system using prismatic daylight collectors. Different apex and tilt angles were analysed allowing it to be varied during the day to increase its efficiency.

Dong and Sanderson present a dynamic adaptive algorithm for 'smart lighting', which provides the appropriate light to meet an occupant's needs for efficiency, productivity and health. Light field sampling was conducted using a distributed sensor network in real time. Experimental simulations show that this method measures less error in the light field, leading to an improvement in lighting control.

Iain Carlile, MSLL, is an associate of DPA Lighting Design

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 A dynamic adaptive light field sampling approach for smart lighting control *F Dong and AC Sanderson*

# New departures

A strong contender in this year's Lux Awards, Heathrow T2's innovative rooflight system is the core of the building's redesign

Light, both natural and artificial, was seen as key to the Terminal 2 redesign from the start. Central to this strategy is architect LVA's 54,000sqm undulating roof system which features integrated rooflights, backlighting and a translucent ceiling membrane. Providing both natural and artificial light, it traces the primary staging posts of the passenger journey – check-in, security and lounge/boarding – increasing in height at those junctures compared to the transitional spaces.

The north-facing rooflights ensure consistent high-quality natural light, with the clerestory design providing sky views. The RGB LED lighting system, controlled by automatic timeclocks and photocells, comes on only when exterior daylight conditions fall low enough, complementing and reinforcing the natural light. The waves of subtle colour reduce the contrast from the daylight, provide a reassuring link to the outside world and create a dramatic backdrop for the departures level.

'The aim was to ensure that the terminal looks great under both natural and electric light,' says Dominic Meyrick, partner of Hoare Lea Lighting, which produced the terminal's initial lighting

T2 will produce 40 per cent less carbon dioxide emissions through extensive natural lighting, LEDs and energy-generation technology

designs and was also responsible for the terminal daylight analysis. 'Linear LED luminaires integrated into the lower lip of the roof section provide backlighting to the edge of the membrane. This mimics and supplements daylight, and ensures a harmonious transition between areas of different brightness. The result is an integrated lighting solution, which works intuitively with the architecture, and accentuates the form of the ceiling.'

StudioFRACTAL took over when HLL's contract ended, replanning the lighting to suit client-led modifications and ensure a cohesive lighting approach across the individual project elements. It also designed lighting for the car park and the impressive expanse of the central covered court, featuring the massive Slipstream sculpture by artist Richard Wilson. Here the aim was to avoid the distraction of downlighting. Instead, an LED lighting system is built into the balustrade supports, incorporating varying optics and concentrating small amounts of light on to the sculpture to emphasise its sinuous motion.

'By day, the undulating rooflights above bathe the sculpture in strong daylight, conveying speed, strength and solidity,' says Tim Downey of StudioFRACTAL. 'As night falls, the subtly changing roof colours create a really atmospheric setting, lending the sculpture a softer, more graceful appearance.'



Photography: James Newton and StudioFRACTAL



**Project:** The £2.5bn redesign of Heathrow's Terminal 2.  
**Client:** Heathrow Airport  
**Lighting design** (concept and phase one scheme) and daylight analysis: Hoare Lea Lighting  
**Lighting design** (phase two scheme, production and commissioning): StudioFRACTAL

