

# 2015 DOE Solid-State Lighting R&D Workshop Agenda

January 27–29, 2015 • San Francisco, CA

TUESDAY, JANUARY 27, 2015	
7:00 a.m.	<i>Registration Opens and Continental Breakfast</i>
<b>PLENARY SESSIONS</b>	
8:00 a.m.	<p><b>OPENING REMARKS</b> SHUJI NAKAMURA, 2014 PHYSICS NOBEL LAUREATE, UNIVERSITY OF CALIFORNIA, SANTA BARBARA</p> <p><b>WORKSHOP INTRODUCTION</b> JAMES BRODRICK, U.S. DEPARTMENT OF ENERGY</p>
8:30 a.m.	<p><b>REINVENTING LIGHTING</b></p> <p>We are in the midst of a lighting revolution comparable to the days of Edison. The LED lighting industry has made huge strides in terms of price and performance. Innovative new products and features continue to broaden the appeal and energy-saving impact of SSL. And leading-edge lighting companies are reinventing lighting as we know it. This talk will share insights on how an innovative, vertically integrated LED company marries R&amp;D and manufacturing, and how R&amp;D investments and product innovations contribute to U.S. competitiveness.</p> <p>JOHN EDMOND, CREE</p>
9:15 a.m.	<p><b>THE CASE FOR SSL</b></p> <p>Walmart has been a pioneer in the use of LED lighting systems in retail, and early installations helped to lay the groundwork for the company's current strategy for implementing energy-efficient lighting solutions in stores worldwide. Learn more about Walmart's vision for transforming retail lighting, and how that impacts energy use, the environment, and the bottom line.</p> <p>JOHN DAVIDSON, WALMART</p>
10:00 a.m.	<i>Refreshment Break</i>
10:30 a.m.	<p><b>INNOVATIONS IN LEDS</b></p> <p>The pace of innovation in today's lighting industry is staggering, and shows no sign of letting up. This talk will share a unique perspective on the past, present, and future of LED lighting, and highlight technology challenges that remain in the path of continued growth, and the road to 250 lm/W.</p> <p>GEORGE CRAFORD, PHILIPS LUMILEDS</p>
11:15 a.m.	<p><b>GLOBAL LED MANUFACTURING</b></p> <p>Insights from Epistar offer a global perspective on LED manufacturing, the evolution of LED technology, and the use of mid-power and high-power LEDs in lighting.</p> <p>BIING-JYE LEE, EPISTAR</p>

<i>Noon</i>	<i>Lunch</i>
1:00 p.m.	<p><b>PANEL   NEW DIRECTIONS IN LIGHTING</b></p> <p>SSL is already saving energy today in many traditional lighting applications. But advances in controls, color tuning, spectral content, and form factors are revolutionizing how light is being delivered and used. This panel will explore innovative applications of LED lighting that save energy and offer value-added benefits for users.</p> <p>MODERATOR: STEVE BLAND, SB CONSULTING  PETER ALSTONE, UNIVERSITY OF CALIFORNIA, BERKELEY  NEIL JOSEPH, STACK  SAEED SHAHMIRZAI, ZOOM ENGINEERING  ROBERT SPIVOCK, GE LIGHTING  GEORGE YIANNI, PHILIPS</p>
2:30 p.m.	<i>Refreshment Break</i>
3:00 p.m.	<p><b>PANEL   CREATING VALUE THROUGH CONTROLS</b></p> <p>The intersection of solid-state lighting, mobile devices, and advanced electronics and sensors will enable completely new ways to control lighting and increase the value of lighting to consumers. Industry and academic experts will share insights on new visions for the wall switch, the value of visible light communications, and feedback from lighting controls installations.</p> <p>MODERATOR: MONICA HANSEN, LED LIGHTING ADVISORS  ETHAN BIERY, LUTRON  KONSTANTINOS PAPAMICHAEL, CALIFORNIA LIGHTING TECHNOLOGY CENTER, UC DAVIS  JOE PARADISO, MIT MEDIA LAB  DAN RYAN, BYTELIGHT</p>
4:30 p.m.	<p><b>WORKSHOP MISSION</b></p> <p>The DOE SSL R&amp;D Workshop provides an opportunity for stakeholders to provide input to the DOE program. This talk will recap the DOE R&amp;D planning process, share highlights from a series of roundtables and meetings held in Fall 2014, and set the stage for in-depth discussions of basic science challenges and priority needs in the breakout sessions to come. Where does future R&amp;D need to be directed to take that next step in SSL performance?</p> <p>MORGAN PATTISON, SSLS, INC.</p>
5:00 p.m.	<i>Adjourn</i>
7:00 p.m.	<p><b>OPTIONAL BUS TOUR (<i>Registration Required</i>)</b></p> <p>Guided tour of LED roadway lighting on the Bay Bridge East Span, plus LED and OLED vignette installations at Acuity's Center for Light &amp; Space.</p>



Noon	Lunch	
<b>TRACK SESSIONS</b>		
1:00 p.m.	<p><b>PANEL   ADVANCED MATERIALS FOR LED LIGHTING</b></p> <p>This panel will explore the development of new materials and architectures for improved performance and functionality in various areas of the LED package and luminaire system.</p> <p>MODERATOR: STEVE BLAND, SB CONSULTING ERIC HAUGAARD, CREE MARC HUEBNER, AUER LIGHTING JOEL MCDONALD, DOW CORNING SPEAKER TBA, THE BERGQUIST COMPANY</p>	<p><b>PANEL   OLED PANEL INTEGRATION CHALLENGES</b></p> <p>This panel will explore challenges surrounding OLED panel integration, and progress on improved encapsulation techniques for both rigid and flexible panels.</p> <p>MODERATOR: LISA PATTISON, SSLS, INC. GREG COOPER, PIXELLIGENT RAHUL GUPTA, CAMBRIOS MARK TAYLOR, CORNING</p>
2:30 p.m.	Refreshment Break	
<b>PLENARY SESSIONS</b>		
3:00 p.m.	<p><b>PANEL   SSL MANUFACTURING CONCEPTS</b></p> <p>Ongoing improvements to LED product designs have enabled dramatic cost reductions while maintaining or even improving performance. While considering product designs for improved manufacturability, companies can also make design decisions that impact the feasibility and economics of domestic manufacturing. This panel will examine how LED chip, package, and luminaire designs are evolving to remove costs, as well as trends in OLED manufacturing and the impact on U.S. competitiveness.</p> <p>MODERATOR: MONICA HANSEN, LED LIGHTING ADVISORS IAIN BLACK, PHILIPS LUMILEDS PIM GROEN, HOLST CENTRE MARK HAND, ACUITY BRANDS PAUL PICKARD, ECOSENSE LIGHTING</p>	
4:30 p.m.	<p><b>A BROADER LOOK AT GOVERNMENT SUPPORT</b></p> <p>The DOE SSL program plays a central role in guiding many related government-supported SSL R&amp;D efforts. This panel will provide an update on the SSL Program’s solicitation process, key changes for FY15, and the new OLED testing opportunity, plus a closer look at the Small Business Innovation Research (SBIR) programs funded by DOE and the National Science Foundation.</p> <p>MODERATOR: JAMES BRODRICK, U.S. DEPARTMENT OF ENERGY JOEL CHADDOCK, NATIONAL ENERGY TECHNOLOGY LABORATORY MANNY OLIVER, U.S. DEPARTMENT OF ENERGY STEVEN KONSEK, NATIONAL SCIENCE FOUNDATION</p>	
5:00–7:00 p.m.	<p><b>RECEPTION/POSTER SESSION</b></p> <p>Project posters will be presented by research team representatives, providing an opportunity for one-on-one discussions with SSL’s leading scientists.</p>	

THURSDAY, JANUARY 29, 2015

7:30 a.m. Continental Breakfast

PLENARY SESSION

8:00 a.m. **THE PHYSIOLOGICAL IMPACT OF LIGHTING**  
 The key function of indoor lighting has always been to enable our visual perception. However, studies have shown that light has effects well beyond visual perception. It stimulates cognitive centers in the brain and drives our inner clock. It also stimulates the receptors in the eye, which can have an activating effect and boost concentration. Light, therefore, has a tremendous influence on our well-being. This talk will discuss recent studies on the impact of LED lighting on human health and performance in a variety of use environments.  
 ANDREAS WOJTYSIAK, OSRAM

TRACK SESSIONS

8:30 a.m.	<p><b>PANEL   ONGOING LED R&amp;D CHALLENGES</b>                  A look at ongoing challenges for LED lighting, and what is needed to develop next-generation lighting.                  MODERATOR: STEVE BLAND, SB CONSULTING                  PETER BLAIS, KEMET                  JAKOAH BRGOCH, UNIVERSITY OF HOUSTON                  STEVE DENBAARS, UNIVERSITY OF CALIFORNIA, SANTA BARBARA                  NATHAN GARDNER, GLO-USA</p>	<p><b>PANEL   OLED MANUFACTURING CHALLENGES</b>                  A look at OLED panel manufacturing status and trends, and what is need for future growth.                  MODERATOR: NORMAN BARDSLEY, BARDSLEY CONSULTING                  JOHN HAMER, OLEDWORKS                  ERIC MEULENKAMP, PHILIPS                  YIQIANG ZHANG, TROVATO MANUFACTURING</p>
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10:00 a.m. Refreshment Break

10:30 a.m.	<p><b>LED TOPIC TABLES</b>                  LED attendees will break into small groups to discuss a variety of topics considered key to furthering SSL technology advances. Each table will focus on a specific R&amp;D topic, allowing for more detailed exploration of the topic and related issues.</p>	<p><b>OLED PRIORITIES</b>                  OLED attendees will have an opportunity to review R&amp;D priorities considered key to furthering OLED technology advances. Input will guide the choice of priority R&amp;D topics and other updates to metrics and milestones in the Plan.</p>
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Noon Lunch

1:00 p.m.	<p><b>TOPIC TABLE REPORTS &amp; DISCUSSION</b>                  Each group will share a brief report of key points related to their topic, with an opportunity for further discussion with the larger group.</p>	<p><b>PANEL   OLED LUMINAIRE PRODUCT DEVELOPMENT</b>                  This panel will share various perspectives on early markets for OLED luminaires.                  MODERATOR: LISA PATTISON, SSLS, INC.                  NANCY CLANTON, CLANTON &amp; ASSOCIATES                  BASAR ERDENER, WAC LIGHTING                  MELANIE KIMSEY-LIN, BOEING</p>
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2:30 p.m.	<i>Refreshment Break</i>
<b>PLENARY SESSION</b>	
3:00 p.m.	<p><b>PANEL   DRIVING ADOPTION: KEY SSL TRADE-OFFS</b></p> <p>SSL represents a rare opportunity to simultaneously provide high-quality, cost-effective, and energy-saving lighting, but there are trade-offs. The SSL industry faces some big questions. How much do we have to choose between quality, efficacy, and price? Can we achieve 200 lm/W with good color quality at a reasonable price? How much extra will consumers pay for energy savings, lighting quality, and controls? How can efficacy, lighting performance, and value be optimized for total energy savings and long-term value?</p> <p>MODERATOR: MORGAN PATTISON, SSLS, INC.  MIKE MCGARAGHAN, ENERGY SOLUTIONS  PETER NGAI, ACUITY BRANDS  STEVE PAOLINI, NEXT LIGHTING</p>
4:30 p.m.	<i>Adjourn</i>