



Cambridge Society for the Application of Research

Churchill College
Storeys Way
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GaN LEDs: How they can save energy, purify water, improve our health and be manufactured in the UK!

Professor Sir Colin J. Humphreys

Department of Materials Science and Metallurgy, University of Cambridge,
27 Charles Babbage Road, Cambridge, CB3 0FS, UK.

7:30 pm, Monday 15th June, 2015

Wolfson Hall Lecture Theatre, Churchill College, Storey's Way, Cambridge

NB Please note that this lecture will be preceded by two short items. Please see 'The Organising Secretary adds'...before 'Practical Matters' at the end of this flyer.

The Lecture:

Colin Humphreys writes:

Gallium nitride (GaN) is poised to save more energy and CO₂ emissions than solar, wind power and biomass together.

InGaN/GaN quantum well LEDs for lighting have the potential to save 10-15% of total electricity usage. The main problem with obtaining widespread use in our homes and offices is cost.

This talk will describe how growing GaN LEDs on large area Si substrates can substantially reduce the cost, and the problems involved.

GaN not only has low power consumption for lighting, it also has for electronics. Replacing Si power electronics by GaN would save another 10% of electricity. So GaN-based devices could save 20-25% of all the electricity we use and 20-25% of CO₂ emissions.

AlGaN/GaN quantum well deep-UV LEDs have the potential to purify water in the developing world (and the developed world) saving millions of lives.

Finally, dynamic colour LED lighting can be optimised for our health, improving our productivity at work, in school classrooms, etc.

Our research on low-cost GaN LEDs is being exploited by Plessey who are now manufacturing millions of these LEDs in the UK.

About the Speaker:

Colin Humphreys is Professor of Materials Science and Director of Research in the Department of Materials Science and Metallurgy and a Fellow of Selwyn College.

He is a Fellow of the Royal Society and a Fellow of the Royal Academy of Engineering. He founded and directs the Cambridge Centre for Gallium Nitride (GaN).

He founded two spin-off companies to exploit the research of his group on low-cost LEDs for home and office lighting. The companies were acquired in February 2012 by Plessey, which is now manufacturing LEDs based on this technology at their factory in Plymouth, UK.

He founded and directs the Cambridge/Rolls-Royce Centre for Advanced Materials for Aerospace.

In his limited spare time he writes books on science and religion and is the author of *The Miracles of Exodus* (Harper Collins, 2003) and *The Mystery of the Last Supper: Reconstructing the Final Days of Jesus*. (Cambridge University Press, 2011), which has recently been translated into Russian, German, Portuguese, Japanese and Greek.

The Organising Secretary adds:

Please note that his lecture will be preceded by

- A 5 minute presentation by CSAR bursary student Olivia Macleod, whose studies on the parasites that cause sleeping sickness could lead to treatments targeting receptors on their surface.

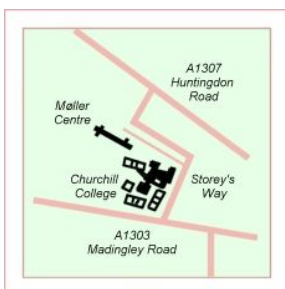
- A brief CSAR SGM, Agenda as follows:

1. Approval of Council's nomination of Dr. Eddie Powell as our new Honorary Treasurer, with effect from October 2015

2. Proposed change to clause 4b of the CSAR Constitution; existing wording is: **b. An Officer may pay out of, or be reimbursed from, the property of CSAR reasonable expenses properly incurred by him or her when acting on behalf of CSAR.**

proposed revision: **b. An Officer or member of Council may be reimbursed for reasonable expenses properly incurred by him or her when acting on behalf of CSAR.**

Practical Matters



Those attending the CSAR lecture may park in the Senior Car Park on Churchill Road, which is off Storey's Way. More parking is available further along Churchill Road, and in the Möller Centre at the far end.

CSAR lectures are open to all; CSAR members are admitted free. Pupils and students may register for free membership at the lecture reception desk.

Non-members are asked to make a nominal contribution of £3.00.

Coffee and biscuits are available in the Wolfson Foyer from around 7pm. For further directions, see: www.chu.cam.ac.uk/about/visitors/directions.php