

# Professor. Gehan Amaratunga



PRECONFERENCE SPEAKER -  
IRCITUM2022

## "QUANTUM DOTS TO LIGHT"

Professor of Engineering. Academic Division:  
Electrical Engineering, University of Cambridge



### Profile

Gehan A. J. Amaratunga has held the 1966 Chair and Professorship in Engineering at the University of Cambridge since 1998. He is also Honorary Professor at Yunnan University and Peking University Graduate School, Shenzhen in China and was the Tan Chin Tuan Visiting Professor at Nanyang Technological University, Singapore. He held the position of Chief of Research and Innovation at the Sri Lanka Institute of Nanotechnology (SLINTEC) 2011-19; and past faculty and research positions at Liverpool, Southampton and Stanford Universities. He is a Fellow of the Royal Academy of Engineering UK, National Academy of Sciences of Sri Lanka, Royal Society of Arts UK and the Institution of Engineering and Technology (formerly the IEE). He has published over 750 archived academic papers and is an inventor on 58 granted patents. His research is in the broad area of materials, devices and technologies for electrical energy and power. It intersects electrical and electronic engineering with physics, chemistry, materials science and information systems. He is also a founder of six start-up companies which have successfully commercialized research from his group, in recognition of which he was awarded the Silver Medal of the Royal Academy of Engineering in 2007.



### Education

1979

**UNIVERSITY OF CARDIFF**

Bachelor of Science Engineering.

1983


**UNIVERSITY OF CAMBRIDGE**

Doctor of Philosophy in Engineering



### Pre-conference speech

 [researchunit@itum.mrt.ac.lk](mailto:researchunit@itum.mrt.ac.lk)

 <https://forms.gle/xi3tiW71ijbWDEzEA>

**Date : 27th October 2022**

**Time : 9.45 am- 10.30 am  
Sri Lanka (GMT + 5.30)**

### SYNOPSIS:

## QUANTUM DOTS TO LIGHT

Quantum Dots (QDs) are termed 0-D semiconductors. Their optoelectronic behavior is governed by size effects which give them characteristics between macro-molecules and nanocrystals. Their size is typically in the 1 -10nm range and are synthesized through wet chemical methods. The presentation gives an introduction to QD synthesis and design for LEDs and full color displays. An intriguing ability which QDs enable is the realization of a full color palette based on many primaries rather than the Red, Green, Blue emitters to which most displays are limited at present. An advantage of using more than 3 primaries is the opportunity it gives to optimize power consumption in generating a color range. QD based photodetectors are also presented. The major limitations of in the development of QD based optoelectronic devices including efficient electron and hole transport in the active QD layer is also discussed